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Best Management Practices for Pesticides on Federal Facilities in the Atlantic Region

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Atlantic Region

Canada

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Environmental Protection Branch
Atlantic Region
Environment Canada
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BEST MANAGEMENT PRACTICES FOR PESTICIDES ON FEDERAL FACILITIES IN THE ATLANTIC REGION

ENVIRONMENTAL PROTECTION BRANCH

ENVIRONMENT CANADA

ATLANTIC REGION

March, 2004

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INTRODUCTION

The managers of federal facilities and federal properties throughout the Atlantic Region are required to economically and safely undertake pest management programs. These may range from the application of insecticides to water for biting fly control, weed and insect control on turfgrass or ornamentals, the handling of products for research trials, or the control of vegetation for brush control or right-of-way management. Before implementing such programs the managers must consider the proper method of pest management and if pest control products are involved, they need to consider the issues of proper product selection, transportation, storage, handling, and disposal. This document, which updates the Code of Good Practice originally produced in 1991, provides federal property managers with a guide to assist them in making safe responsible managerial decisions that reduce the risk to employees, by-standers, the community, and the environment. Included in this document is a detailed overview of the importance of using Integrated Pest Management Planning as a modern approach to managing pest problems.

The document is divided into three Parts. Questions on the best practices for pest management decision-making, and all aspects of pest control product management are presented in Part I. Part II contains the background from which the prescriptive measures in Part II are described as well as the federal and provincial legislation governing the regulation of control products. Additional reference material for the property manager are contained in Appendices 1-25.

The regulation of pesticides is managed through a combination of complimentary federal and provincial legislation. The key federal legislation is the *Pest Control Products Act* which deals principally with the registration, use directions, packaging, product labelling, exportation and importation of all pest control products used in Canada. Other aspects of pesticide control addressed at the federal level are outlined in Part II of the document.

All four provincial governments in the Atlantic Region have Acts that compliment federal legislation and enable province specific regulation of pest control products within their respective jurisdictions. Activities legislated include the regulation of transportation, sale, handling, use, disposal, or wrongful management of pest control products. The degree to which these acts apply to federal lands has never been legally challenged, however federal agencies are expected to adhere to provincial requirements when undertaking programs that involve the application of pest control products.

The intent of this document is to assist facility managers in the planning, managing, coordination, and the undertaking of safe and environmentally appropriate pesticide application programs at federal facilities throughout the Atlantic Region. Included are guides for the proper transportation, storage, selection, application and disposal of pesticides, as well as a source of information on provincial regulatory requirements, buffer zones for the products used in the region, and technical information to assist program managers.

The document is not intended to replace the review of programs by any federal or provincial regulatory agency or to take precedent over any regulatory requirements.

Federal and provincial pesticide legislation is continually being rewritten, updated, and improved. To accommodate these changes, Environment Canada will attempt to keep the Best Management Practice as current as possible and will advise the mangers of federal facilities.

INTRODUCTION

Les gestionnaires des installations et des propriétés fédérales de la Région de l'Atlantique doivent mettre en oeuvre des programmes de lutte antiparasitaire qui soient à la fois économiques et sûrs. Ces programmes de lutte vont de l'épandage d'insecticides à l'utilisation de l'eau pour le contrôle des insectes piqueurs, la lutte contre les mauvaises herbes et les insectes sur les pelouses en plaques ou sur les plantes ornementales, la manutention des produits pour les expériences scientifiques, le contrôle des broussailles et la gestion des emprises. Avant la mise en oeuvre de ces programmes, les gestionnaires doivent tenir compte des méthodes adaptées de contrôle antiparasitaire; si le contrôle exige l'utilisation de produits antiparasitaires, ils doivent également prendre en compte les informations pour la sélection du produit qui convient, son transport, son entreposage, sa manutention et son élimination. Le présent document, qui est une mise à jour du Code de bonne pratique publié en 1991, est un guide à l'intention des gestionnaires des propriétés fédérales. Il est destiné à les aider à prendre des décisions capables de réduire les risques que l'utilisation des pesticides fait peser sur les employés, le public, la collectivité et l'environnement. Ce document comporte un exposé détaillé sur l'importance de l'utilisation d'un programme intégré de planification et de gestion dans la lutte antiparasitaire. Le programme intégré est une approche moderne des problèmes liés à la lutte contre les parasites.

Le guide est divisé en trois parties. La partie 1 présente les pratiques exemplaires qui doivent guider la prise des décisions dans la lutte antiparasitaire ainsi que des renseignements détaillés sur la gestion des produits antiparasitaires. La partie 2 comprend de plus amples détails sur les points mentionnés dans la partie 1, ainsi que les lois fédérales et provinciales réglementant l'utilisation des produits antiparasitaires. Le document comporte en plus du matériel de référence sur la gestion des propriétés dans les annexes 1 à 25.

Le règlement sur les pesticides est un amalgame des lois fédérales et provinciales. La principale loi fédérale sur les pesticides est la *Loi sur les produits antiparasitaires*. Cette loi réglemente plus particulièrement l'homologation des pesticides, les modes d'emploi, l'emballage, l'étiquetage, l'exportation et l'importation des produits antiparasitaires au Canada. Les autres points relatifs au contrôle des pesticides mentionnés dans le règlement fédéral sont abordés dans la partie 2 du présent document.

Tous les quatre gouvernements provinciaux de la région de l'Atlantique ont adopté des lois qui viennent compléter la loi fédérale. Les lois provinciales permettent aux gouvernements provinciaux d'avoir, à l'intérieur de leurs ressorts territoriaux, un cadre juridique qui leur permet de contrôler l'utilisation des produits antiparasitaires. Elles comprennent des guides sur le transport, l'entreposage, la sélection, l'usage et l'élimination des produits antiparasitaires, ainsi que de l'information sur les exigences réglementaires des provinces, les zones tampons à établir pour l'utilisation des produits dans la région concernée et les renseignements techniques utiles aux gestionnaires des programmes antiparasitaires.

Le présent document ne remplace en rien l'examen des programmes par tout organisme fédéral ou provincial de réglementation, et n'a préséance sur aucune exigence réglementaire.

Les lois fédérales et provinciales sur les produits antiparasitaires font continuellement l'objet de révisions, de mises à jour et d'améliorations. Pour faire connaître ces changements, Environnement Canada s'efforcera de tenir à jour le présent guide de bonne pratique et de conseiller les gestionnaires des installations fédérales.

PART I
BEST MANAGEMENT PRACTICES

This part of the Best Management Practices contains the prescriptive measures that can be used to prevent the unwanted effects of pesticides. The rational and background for these recommendations are presented in Part II.

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1.0 PEST MANAGEMENT

ACTIVITY	RECOMMENDED PRACTICE
1.1 Integrated Pest Management	a) Wherever possible and practical managers should implement an Integrated Pest Management (IPM) program (see Section 2.2 of Part II of Best Management Practices for more details). b) Use a coordinated approach in an attempt to prevent the pest from reaching a level where treatment is required. c) Only undertake a treatment when pest numbers justify it. d) Consider a variety of control methods for the treatment.

2.0 PRODUCT SELECTION

ACTIVITY	RECOMMENDED PRACTICE
2.1 Product Selection	a) When a pesticide application is warranted, choose products that are the least toxic to non-target organisms, least persistent, least mobile, and most selective. b) Only products registered under the *Pest Control Products Act (PCP Act)* may be used.
2.2 Obtaining Pesticide Products	a) Use the label directions for application rates to calculate the minimum amount of product to purchase (see Appendix 13). Avoid having excess product that will require storage. b) Purchase or remove from storage only the amount required to conduct the treatment. c) Make certain the label on the container is legible and indicates that the product is registered under the *PCP Act*. d) Do not purchase or take from storage a damaged or leaking container.

3.0 TRANSPORTATION

ACTIVITY	RECOMMENDED PRACTICE
3.1 General Precautions	a) Before transporting pest control products check whether the quantity and type of product is scheduled under the requirements of the *Transportation of Dangerous Goods Act* (TDGA). A complete version of the Act can be found on Transport Canada's official web site at: http://www.tc.gc.ca/tdg/clear/menu.htm. b) Revised TDG regulations came into force on August 15, 2002. NOTE: TDG certificates dated prior to August 15, 2002 must be renewed. The following requirements relative to these Best Management Practices are presented in Appendix 16: • Exemptions for Personal Use • 500kg Exemption • 1500kg Farm Vehicle Exemption • 3000kg Retail Exemption • Agriculture: Pesticide Exemption c) Check with provincial authorities for specific requirements for transportation of pesticides or seed treated with pesticides in the Atlantic Region. d) Pesticides must be transported in a separate compartment from that of the occupants, foodstuffs, animal feed, bedding, clothing, cosmetics, or household furnishings. e) Pesticide treated seed must be labeled and covered. f) Vehicles holding pesticides should be locked when unattended. g) Any vehicle contaminated by pesticides must be decontaminated before the vehicle can be used for any other purpose.
3.2 Packaging	a) All pesticide containers must have the original label that is legible and conforms to the *PCP Act.* b) Pesticides should only be transported in their original container. c) Pesticides should not be transported in an open

ACTIVITY	RECOMMENDED PRACTICE
	container. Partially used containers should be resealed and repackaged before they are transported. d) Pesticide containers should be secured or stacked in such a fashion as to avoid abrasion or tipping. e) Paper and cardboard pesticide containers should be protected from moisture.
3.3 Documentation	a) In cases where the amount or class of pesticide transported is regulated under the *TDGA*, documentation should be prepared in accordance with the *Act*. b) The driver should have a list (Trade Name, *PCP Act* Registration Number and quantity) and a Material Safety Data Sheet (MSDS) for each product on board. c) The driver should have a copy of the Emergency Response Plan (ERP) for vehicle accidents.

4.0 STORAGE

ACTIVITY	RECOMMENDED PRACTICE
4.1 Bulk Storage and Warehousing	
4.1.1 Siting and Exterior Requirements	a) The operator should check with federal, provincial and municipal governments to determine whether there are by-laws or regulations which apply. b) Ensure pesticides are stored safely for employees of the facility, the community, and the environment. c) Storage facilities should be at least 50m from zoned residential property lot lines, hospitals, schools, food or feed processing plants, shopping centres, and other high occupancy buildings. d) Facilities that do not meet (b) should have documentation from the local Fire Department or Planning Authority that they agree to allow the facility to operate. e) The facility should not be sited any closer than the recommended distance as defined in provincial regulations to a watercourse and/or open body of water. f) Entrances leading into the facility should be posted with a sign in both official languages indicating that pesticides are being stored and only authorized persons are entitled to enter. g) All exterior windows and doors should be secured and locked when unattended.
4.1.2 On-Site Access	a) The facility should be accessible to fire fighting equipment on at least 2 sides. b) The site layout should provide suitable loading and unloading areas so that the potential for accidents is minimized. c) Inclines for forklift trucks should not be greater than 10º. d) Lighting for unloading or loading vehicles should be provided either on the forklift or on the building.

ACTIVITY	RECOMMENDED PRACTICE
4.1.3 Facility Structure	a) All facilities should be constructed to be in compliance with the National Building Code Standards. b) Exterior walls should be constructed to provide a minimum of one (1) hour fire resistance or are of non-combustible material. c) Interior walls to the storage compartment should have a minimum of two (2) hour fire resistance. d) Doors, vents, and openings in these walls should be in compliance with the National Building Codes Standards. e) Ventilation should be such that air is not drawn from the storage facility into adjoining rooms. f) All exit man doors must open in the direction of exit. g) The floor should be smooth with all cracks filled. h) There should be no active floor drains in the facility. i) The storage area should be protected by a retention curbing or designed containment system that will hold at least 110% of the maximum anticipated volume of product stored. j) The ventilation system should have at least one (1) intake and one exhaust duct located no higher than 300mm from the floor. The system should be designed to provide a minimum of two (2) air exchanges per hour and prevent the accumulation of vapours above the occupational exposure limits. k) The heating system should be designed and installed so that it does not provide a source of ignition for flammable or combustible vapours. l) Lighting should be of sufficient intensity to provide safe working conditions. m) All electrical work and repairs should conform to the Canadian Electric Code.
4.1.4 Safety and Security Equipment	a) Portable fire extinguishers should be installed in or adjacent to corridors, exits, and aisles.

ACTIVITY	RECOMMENDED PRACTICE
	b) Storage facilities require a minimum 2-A:10-B:C class fire extinguisher within 9m or a minimum 2-A:20-B:C class fire extinguisher within 15m travel distance to the extinguisher. c) The entire facility should have a fire detection system throughout that is connected to a 24-hour monitoring station. d) Emergency equipment should include a first aid kit, an eye wash station (should meet ANSI Z 358.1-1981 standard to the extent that it is reasonable), spill kit (see Appendix 8), and personal protective equipment (gloves, respirator, coveralls, goggles, and rubber boots). Respirator should be selected to the CSA standard Z 94.4-93. e) Signs should be posted indicating no smoking, eating, or drinking in the storage facility.
4.1.5 Staff Safety and Training	a) Staff handling pesticides should have training in first aid, CPR, WHMIS, a lift truck (if used), the use of MSDS, and the operation of a fire extinguisher. b) The facility should have a set of operating rules, Safe Operational Procedures, and an Occupational Health and Safety training program should be implemented and all staff should be familiar with them. c) Records of training should be kept and updated as required (see Appendix 3 for list). d) Staff should wear protective equipment when handling pesticides.
4.1.6 Maintenance and Inspections	a) The facility should have a written procedure for the care of the eye wash station, fire extinguishers, personal protective equipment, and a spill response kit with monthly inspection (see Appendix 4 for a Check List). b) The facility should have a written inspection program for its electrical installation (fans, wiring, switches, circuit breakers, and main panel) (see Appendix 5 for a Check List). c) The facility should have a written procedure for testing the fire detection system.
4.1.7 Documentation	a) Copies of MSDSs for all the products stored at the facility

ACTIVITY	RECOMMENDED PRACTICE
	should be available in case of an emergency. b) An inventory of the product being stored should be available off site.
4.1.8 Emergency Response Plans	a) Management should conduct a risk assessment of the facility and the site, identifying major risks (see Appendix 1). b) ERPs should be developed for a fire in the facility, major spill, employee injury, and accident involving the transporting of pesticides (see Appendix 7). c) Copies of the ERP should be available to all employees and reviewed on an annual basis. d) The facility should establish an organization chart, maintain a list of emergency phone numbers (see Appendix 6), have a written containment plan, and a list of emergency response equipment. e) The ERP for fire should include a site plan showing how contaminated water will be contained on site (see Appendix 7). f) On an annual basis the local fire department should be invited to visit the site and conduct a simulated emergency with the staff.
4.1.9 Product Storage Requirements	a) Pesticides should not be stored in the same facility with foodstuffs, food processing equipment, personal use items, or animal feed. b) Pesticides should be stored such that material-handling equipment has sufficient room to manoeuvre. c) Product should be stored according to their National Fire Code classification, paying special attention to storage heights and compatibility rating (see Appendix 2). d) Containers should be stored on pallets or racks, with adequate spacing to allow spills to be easily detected.
4.2 Small Quantity Storage	
4.2.1 Requirements	a) Pesticide storage rooms or metal cabinets containing small quantities of pesticides located within a larger facility should

ACTIVITY	RECOMMENDED PRACTICE
	conform with the recommendation set in Section 4.1 "Bulk Storage and Warehousing", as much as practical. b) Pesticide storage rooms or metal cabinets should have a containment capacity of 110% of the volume of product stored. c) Entrances leading into the storage room or metal cabinets should be posted with a sign in both official languages indicating that pesticides are being stored and only authorized persons are entitled to enter. d) All entrances to the storage area should be locked when unattended. e) An inventory of stored material should be posted and kept in a separate location as well as provided to local emergency response agencies.
4.3 Outdoor Storage	
4.3.1 Temporary Site Storage	For a number of the larger programs that were conducted on federal properties, away from permanent storage facilities, the proponent or the contractor (generally) supplied a tractor trailer, the trailer part as a mobile storage building. A tarp and hay bales were placed under the trailer, in the event that the product was spilled during transfer. This situation was amenable to all parties. a) Field or temporary storage is not recommended. b) If required on a temporary basis, seek advice from Environment Canada or the appropriate provincial pesticide regulatory authority. c) Product should only be stored outside for very brief times at a treatment site. d) Only weatherproof packaging such as 200L drums may be stored outside. Check the label to ensure that their contents are not sensitive to temperature extremes. e) The outside storage areas should have a firm, impermeable base and be surrounded by a containment sill or berm capable of holding 1.5 times the volume of pesticide stored. f) Drums should be stored on pallets and bags or cardboard

ACTIVITY	RECOMMENDED PRACTICE
	containers should be covered from the weather. g) The area should be protected with 24-hour security and clearly displayed chemical warning signs posted in both official languages. h) An emergency spill kit, eye wash station, and fire extinguishers should be maintained on the site. i) Take whatever additional precautions necessary to prevent the impairment of human health and the contamination of the natural environment.

5.0 HANDLING

ACTIVITY	RECOMMENDED PRACTICE
5.1 Safety Precautions	
5.1.1 Protective Clothing	a) The following protective clothing should be worn when handling concentrated product during the mixing and loading operation or if there is a pesticide spill: • unlined chemical resistant gloves, • impermeable splash apron, • unlined boots impermeable to chemicals, • a broad brimmed hat or hard hat, • cotton coveralls or disposable coveralls, and • eye goggles and a half face respirator or a full-face respirator (depending on the expected concentration) equipped with chemical cartridges approved for the pesticides being used. b) Appropriate respirators should be worn when there is a risk of inhaling pesticide dust, spray mist, or vapor. c) Unlined chemical resistant gloves should be worn whenever pesticide product or pesticide containers are handled. d) A complete set of personal protective clothing should be stored in the spill kit in the storage area or on vehicles transporting pesticides.
5.1.2 Fitting and Removal	a) Respirators should be fitted so that all air inhaled passes through the charcoal filter. Fit testing should be conducted in accordance with the CSA Standard Z 94.4-93 Selection, Use and Care of Respirators. b) "Respirators requiring a tight fit in order to perform effectively shall not be worn when an effective seal with the face of the person cannot be achieved and maintained". c) A secure fit is not possible for persons with beards, a mouth bit respirator must be used. d) The sleeves and cuffs of coveralls should be worn over

ACTIVITY	RECOMMENDED PRACTICE
	gloves and boots. e) Cuffs of gloves should be rolled up. f) Protective clothing should be removed and washed in the following sequence: • with the gloves still on, remove and wash goggles, apron, boots, respirator, and hardhat; • wash gloves with soap and warm water; • remove cloth hat and coveralls, place in a separate plastic bag for laundering later; • remove gloves taking care not to contaminate the hands; • wash gloves and check for leaks; and • wash hands with plenty of soap and warm water.
5.1.3 Protective Equipment Maintenance	a) Protective clothing should be washed at the end of each working day. Use heavy duty setting on washer and dry by hanging on a clothesline. b) Protective clothing should not be washed with personal clothing. c) Protective clothing that has been contaminated with large quantities of pesticides should be placed in heavy plastic bags for disposal. Refer to 7.4 for disposal details.
5.1.4 Personal Hygiene	a) Eating, drinking and smoking should be prohibited in the work area. b) Eating or smoking should not be conducted until pesticide residues have been cleaned off workers. c) Clean clothing is to be stored in a separate locker from work clothes. d) Where possible disposable coveralls should be used. e) Where reusable coveralls are provided and used, a safe work procedure for the cleaning process should be written and implemented. f) Contaminated clothing should not be taken home.

ACTIVITY	RECOMMENDED PRACTICE
	g) Pesticide spills should be cleaned immediately using safe work procedures developed in advance using the appropriate protection required. h) Persons working with pesticides should not rub the eyes or touch the mouth. Hands should be washed thoroughly before eating, smoking, or using the toilet. i) Persons handling pesticides should shower thoroughly, with special attention to hair and fingernails.
5.1.5 Mixing and Loading	a) All protective clothing mentioned in 5.1.1 Protective Clothing, should be worn during the mixing and loading process. b) Mixing instructions on the label should be followed exactly and quantities measured exactly. c) When an application tank is used to mix the pesticide concentrate with water or another liquid, the pesticide should be added when the tank is partially full unless otherwise prescribed on the label. d) Mixing should be carried out in a specified area that is well ventilated and designed to facilitate the easy clean up of any spilled material, and where few people are allowed entrance. e) Pesticide containers should be opened carefully on a stable surface where they will not easily tip or spill. f) When opening, pouring, or mixing a pesticide, stand up wind to minimize incidental contact. g) Persons handling a highly toxic pesticide should not work alone. h) Wettable powder should be mixed in a large bucket by stirring the required amount of powder with a paddle in enough liquid to make a smooth mixture. i) Loading and mixing equipment (stirring paddle, measuring cans, pumps, etc.) should be properly cleaned and stored away when not in use. j) Rinsings should be added to the pesticide spray

ACTIVITY	RECOMMENDED PRACTICE
	mixture or saved as dilution water for the next application. The concept is to put any pesticide on an intended target, thus removing the requirement for disposal. k) The water should be brought to the mixing tank rather than the mixing tank to the water. l) Pesticide containers should not be brought within 25m of a body of water, unless otherwise stated on the label. m) Mixing and loading of pesticides should not occur within 25m of a body of water, unless otherwise stated on the label. n) All pumps used during loading must have a back-flow prevention device and the operation should not be left unattended. o) Spills should be cleaned up immediately.

6.0 APPLICATION OF PESTICIDES

ACTIVITY	RECOMMENDED PRACTICE
6.1 Use of Contractors	a) Facility managers must ensure that contractors have obtained the proper licenses, permits, and insurance protection in accordance with the appropriate provincial legislation. b) All staff working on the contract must hold a certificate valid for the nature of their job, as issued by the respective province.
6.2 Public Notification	a) Nearby residents, property owners and federal employees should be notified as to the date and time of pesticide application. b) Signs stating the application company's name, product trade name, PCP No., date of application, and safe entry time should be posted at access points to the areas of pesticide application. c) Applications may require notification in the local newspaper. Contact the provincial pesticide regulatory agency or the local Environment Canada office for provincial site posting requirements. d) Follow provincial requirements for posting of points of access and supervision of the area following application.
6.3 Public Access Location	a) Contact Environment Canada or provincial regulatory agencies for applications to property where public has access or lands adjacent to property where public has access. b) Pesticides should not be sprayed on schoolyards, recreational areas, picnic areas, parks or any adjacent property during use hours.
6.4 Drift	
6.4.1 Product Drift	a) Applicators should minimize off-site product drift to habitat areas, aquatic areas, wildlife, and susceptible crops adjacent to sprayed area by the use of buffer

ACTIVITY	RECOMMENDED PRACTICE
	zones. b) Aquatic and other sensitive habitats should be protected by no- buffer zones. A list of recommended buffer zones produced by Environment Canada for products used in the Atlantic Region can be found in Appendix 18. Environment Canada should be consulted for buffer zones for products not listed in Appendix 18. c) Read the product label as some have buffers noted on the Directions for Use. d) In cases where more than one buffer is recommended, applicators must comply with the most restrictive (largest) buffer. e) The largest droplet size compatible with effective treatment should be used to reduce product drift. Sprayer pumps should be left at a low pressure setting to reduce the likelihood of generating small droplets. f) Wind speed and height of application can also affect the amount of drift. Some labels and most provincial permits or licences have conditions on maximum allowable wind velocity. g) In the case of a conflict between the label and a permit condition, applicators must comply with the most restrictive (lowest) wind velocity. h) To minimize the likelihood of vapour drift select low volatility forms of products. i) During aerial and some ground applications of pesticides, meteorological conditions should be checked and recorded every 15 minutes. j) Pesticide spraying should not be carried out if it has rained within the last four hours or if rain is forecast in the next four hours. k) Pesticides should not be applied by air if the winds at release height are greater than 15km/h or less than 2km/h. l) Aerial and ground applicators should check

ACTIVITY	RECOMMENDED PRACTICE
	recommended wind velocity conditions in provincial regulations, permits, or licences, as well as the "Directions for Use" on the label. In the case of a conflict between a wind speed conditions on a label and a provincial requirement, applicators must comply with the most restrictive (lowest) wind velocity. m) Pesticide spraying should not be carried out if the temperature exceeds 25°C or is expected to exceed 25°C during the day of application. n) In the case of conflict between a maximum application temperature on the label and a provincial requirement, applicators must comply with the most restrictive (lowest) temperature. o) Spraying of pesticides should not be carried out when the relative humidity is less than 50%.
6.4.2 General Precautions	a) Persons involved with the handling of products that are classified as "Cholinesterase Inhibitors" on the label should have their baseline blood cholinesterase level tested before the start of a program and repeated throughout the program. b) Application equipment must be calibrated and all parts checked for any wear prior to operation. c) Application instructions on the label must be noted and followed. d) Persons applying a highly toxic pesticide should not work alone. e) Applicators should ensure that the appropriate prescribed time elapses between application and crop harvest or personnel re-entry. f) Flagmen should not be used in the treatment area and unauthorized persons should be kept from entering treatment areas during pesticide application and until after the approved re-entry time. g) When applying pesticides, potential contact can be minimized by: • wearing appropriate personal protective equipment at

ACTIVITY	RECOMMENDED PRACTICE
	all times; • standing up wind when applying pesticides; • not smoking, drinking, or eating while applying pesticides; • avoid walking through areas already treated; and • washing thoroughly following an application and before eating, smoking, drinking, or using the toilet.
6.4.3 Record Keeping	a) The details of each pesticide application should be recorded and stored for future reference. Information recorded should include: • date and time of application; • location of application; • pest treated (pest identified by stage, density.); • target site (entire area, spot treatment); • pesticide (Trade name and *PCP Act* No.); • rate of application and amount used; • applicator's name and license or certificate number; • type of application equipment and equipment settings (*e.g.*, nozzles used, pressure, spacing, speed, boom height); • meteorological conditions (*e.g.*, rain, wind, temperatures) and anything else that might affect the application; • adjacent areas (*e.g.*, crops, habitation, sensitive environment); • any environmental effects resulting from pesticide use; • evaluation (which must be undertaken within 1 day to 1 week for insecticide applications and 1 week to 1 month for herbicide application) of the application (degree of control).

7.0 SPILLS

ACTIVITY	RECOMMENDED PRACTICE
7.1 Spill Contingency Plan	
7.1.1 General Clean-Up Procedures	a) Spills should be cleaned up as quickly and safely as possible. b) General clean-up procedures include: • keep people and animals away from the spill site to eliminate chance of exposure or breathing of fumes; • consult the label and MSDSs to obtain as much information as possible on how to clean up the spill; • seek additional information from the provincial regulatory agency or CANUTEC; • do not try to wash spilled material away with water, this only spreads the pesticide and will result in more contamination of the environment. It takes a great deal of water to dilute the pesticide to non-hazardous concentrations.
7.1.2 Spill Treatment Equipment	a) The plan should include having spill treatment equipment ready at storage, mixing, and loading sites that include the following: • personal protective equipment (*e.g.,* unlined gloves, boots, and respirator); • absorbent material such as sand, activated charcoal, vermiculite, dry coarse clay, kitty litter, or commercial absorbent; • neutralizing material such as lime, chlorine bleach, or washing soda; • a long-handled broom; • a non-sparking shovel; • a waste-receiving container with lid; • a list of clean-up and hazardous waste disposal companies. For advice contact Environment Canada emergencies at 1-800-565-1633.
7.1.3 Emergency Response Plan for a Minor Spill	a) Wear personal protective equipment as required if the spill is inside a room or shed; b) Ventilate the area, open doors and windows and use fans if necessary;

ACTIVITY	RECOMMENDED PRACTICE
	c) Absorb liquid material using activated charcoal, coarse clay, or kitty litter, commercial absorbents are also available; d) Shovel the contaminated absorbent material into a drum; e) Label the drum (name of pesticide and date); f) Place waste material from spill clean-up into a waterproof container that can be removed from the site; g) Label waste material with the name, PCP Number and quantity of the pesticide and treat as a hazardous waste; h) Contact Environment Canada for advice on disposal; i) Neutralize any remaining residues; and j) Consult the MSDS and other information sources to determine specific neutralization techniques and contact a licensed hazardous waste handling company.
7.1.4 Emergency Response Plan for Major Spills	a) Assess the hazard and wear personal protective equipment; b) Contain material by dyking the area with an earthen dam. This will reduce the potential of contaminants from entering water supplies and drainage systems. A barrier may consist of soil, sawdust, old newspaper or anything to soak up the pesticide. Make the dyked area as small as possible. Provide a barrier to the spread of the pesticide. c) Contact Environment Canada for advice on handling and clean-up of large spills; d) Do not wash the spill away with large quantities of water. Close any drains; e) Pump large spills into drums; f) Put commercial absorbent material or kitty litter over the spill area and shovel this and any contaminated soil into drums; g) Label the drums (pesticide and date); h) Neutralize any remaining residues;

ACTIVITY	RECOMMENDED PRACTICE
	i) Consult the MSDS and other information sources to determine specific neutralization techniques; j) Decontaminate the affected surface(s); and k) Check if the label has specific instructions. In the Maritimes call 1-800-565-1633 for additional advice. Some general guidelines include: • Organophosphates - many such as azinphosmethyl, chlorpyrifos, diazinon, dimethoate, malathion, parathion and temephos can be detoxified with a mixture of washing soda (sodium carbonate) and bleach (sodium hypochlorite); and • Carbamates - such as aldicarb and carbaryl - use caustic solutions such as washing soda (sodium carbonate), caustic soda (sodium hydroxide) or strong soap solution.
7.1.5 Dry Product Spills	a) Shovel the material into drums with tight-fitting lids; b) With dusts, dampen with water using a fine mist before sweeping; c) Do not use a vacuum cleaner unless equipped with a filter bag capable of collection of fine dusts; d) Label the drums (pesticide and date); e) Contact the local pesticide regulatory authority if required and a licensed hazardous waste handling company; f) Neutralize any remaining residues; g) Consult the MSDS and other information sources to determine specific neutralization techniques; and h) Never use water to wash down a spill. The chemical will leach into the soil and may enter the water system, sewage system, streams, or lakes.
7.1.6 Following a Spill	a) Assume all equipment (coveralls, gloves, boots, shovels, etc.) used is contaminated and quarantine it for decontamination or disposal; b) Thoroughly decontaminate the truck containing the spilled material before transporting other products;

ACTIVITY	RECOMMENDED PRACTICE
	c) Ensure all emergency responders involved in the clean up implement personal decontamination procedures; and d) Watch for poisoning symptoms in any employees or emergency responders.

8.0 DISPOSAL

ACTIVITY	RECOMMENDED PRACTICE
8.1 Waste Generation	a) Every effort should be taken to minimize the amount of pesticide waste generated which requires disposal. b) This can be done by accurately calibrating the spray equipment with water only prior to undertaking the project and the size of the area for treatment and then double-checking the calculations used to determine the application mixing rate (see Appendices 12 and 13 for details). c) Purchase and then prepare only the amount of pesticide formulation required for the application.
8.2 Containers	a) Where possible, pesticides should be purchased in containers designed for return to the supplier or manufacturer for refilling. These are sometimes referred to as "multi-trip" or "pre-packaged" containers. b) All plastic containers must be triple rinsed or rinsed under pressure (jet rinsed) for 30 seconds. c) When rinsing, the closure should be firmly replaced and the container should be shaken or rolled to ensure rinse water has reached all interior areas of the container. d) A pesticide container should be thoroughly drained, e.g. drainage should continue for 30 seconds after the flow is reduced to drops, and the rinsate placed into the spray tank as part of the make-up water. e) Bags are to be shaken or triple rinsed. f) Contact the provincial regulatory authority for a list of authorized collection sites within the Atlantic Region. g) Clean, triple rinsed, plastic containers must be incorporated into the National Container Recycle Program. h) All single trip plastic containers incorporated into this program are triple rinsed, taken to designated collection sites (usually the point of purchase), where they are inspected, and later chipped for use in the generation of fence posts, fuel, or curb stoppers.

ACTIVITY	RECOMMENDED PRACTICE
	i) Containers are never to be buried or burned without the written approval of the provincial pesticide regulatory authority.
8.3 Unused Pesticides	a) Whenever possible, unused quantities (unopened containers) of pesticides should be returned to the dealer or exchanged with other users. b) If pesticides cannot be returned or exchanged, consideration should be given to the following alternatives: c) storing the pesticides for future use; or using a recommended method of detoxification. d) If the above alternatives are not acceptable, contact the provincial regulatory authority or a waste disposal company to dispose of unwanted product (see list in Appendix 10). e) If product remains in the sprayer at the end of an application, re-work the calculations to see where the error was and make note of this for future applications.
8.4 Cleaning of Application Equipment	a) Application equipment should be considered dangerous until it has been cleaned and decontaminated. b) Operators should put on chemical resistant gloves and boots, coveralls, and goggles before washing or carrying out maintenance on application equipment. c) Application equipment must be thoroughly cleaned before changing pesticides. d) Application equipment must not be cleaned near natural water sources, near a wellhead, or in such a way as to allow washings to enter a watercourse. Check with provincial regulatory authorities for recommended distances. e) Application equipment should be checked regularly, and worn or deteriorated parts should be replaced immediately. Sprayers will have to be recalibrated following any change in nozzles, pump, or hoses (see Appendix 12).
8.5 Disposal of Equipment Washing	a) Whenever possible, equipment wash water should be

ACTIVITY	RECOMMENDED PRACTICE
	stored in separate tanks and used as dilution water in the next spray application. b) Small amounts of equipment wash water may be sprayed on land on which the product has been applied for the purpose of pest control or on flat land at least 200m from surface water or wells, provided the soil does not consist of gravel, sand, or other similarly porous material. c) Collection of wash water into containers for evaporation is recommended for large or frequent applications. d) Consult the provincial pesticide regulatory agency for additional methods of disposal.

PART II
BACKGROUND INFORMATION

This part of the Best Management Practices contains greater detail and background information for the recommendations presented in Part I.

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1.0 PESTICIDE LEGISLATION

1.1 Introduction

Pesticides are regulated by the federal and provincial governments to protect the applicator, the consumer, and the environment. The federal laws deal principally with the manufacture and registration of products for use in Canada, the labeling of the products, and the import and export of products. Provincial legislation complements the federal legislation and regulates the life of a product once it enters the province and are often more restrictive in some areas than the federal legislation. Federal and provincial legislation are based on current scientific knowledge.

1.2 Federal Pesticide Legislation

1.2.1 Pest Control Products Act

The major federal legislation regulating pesticides in Canada is the *Pest Control Products Act* (*PCP Act*) and Regulations. The responsibility for administering this legislation rests with the Pest Management Regulatory Agency (PMRA) under Health Canada. The regulations focus attention on human health, environmental protection, and pesticide performance.

The main purposes of the *PCP Act* and Regulations are to ensure that:

- no person shall manufacture, store, display, distribute, or use any pest control product under unsafe conditions;
- no person shall package, label, or advertise any pest control product in a manner that is false, misleading, or deceptive, or is likely to create a false impression about the pest control product; and
- no person shall sell in or import into Canada a pest control product unless it is registered.

Before a pesticide can be sold or considered for use in Canada it must first be registered under the *PCP Act*. Staff within the Pest Management Regulatory Agency (PMRA) are responsible for evaluating the scientific data submitted by the manufacturer on the efficacy under Canadian conditions, the toxicology, food and feed residues, environmental chemistry and fate, environmental toxicology, and chemistry of the product. Only after an extensive review based on the safety, efficacy, and merits of the product, is a decision made. Once a pesticide is registered it is given a unique, product specific Pest Control Product (PCP) "registration" number. This registration provides the manufacturer with the right to sell or manufacture the product in Canada and therefore products without PCP Numbers may not be used in Canada.

The PMRA has established a Pest Management Information Service to provide information on the registration process, product labels, safety precautions, and alternative pest management practices. This service can be accessed by calling 1-800-267-6315, or by e-mail at pmra_infoserv@hc-sc.gc.ca, or via the PMRA website at http://www.hc-sc.gc.ca/pmra-arla/english/index-e.html.

Under the *PCP Act*, registered pesticides are classified as Domestic, Commercial, Restricted, or Manufacturing depending on their toxicity and intended use. The classification of a product appears on the label.

The terms Agricultural or Industrial that often appear on a label are substitutes for the term Commercial.

1.2.2 Other Federal Legislation

Other federal legislation regulates different aspects of pesticide use including pesticide residues in foods, damage to fish or fish habitat, damage to migratory birds, and transport of dangerous goods. These are described in the following section.

1.2.2.1 Transportation of Dangerous Goods Act (TDGA)

Transportation of Commercial and Restricted Class (non-Domestic) pesticides are regulated by the *Transportation of Dangerous Goods Act* (*TDGA*). This legislation is the responsibility of Transport Canada, but has also been adopted and administrated under provincial legislation. Also included in this legislation are the requirements for the transporting of waste dangerous goods. Consult the provincial pesticide regulatory authorities for details.

The *TDGA* regulations are made up of thirteen parts, which cover various aspects of dangerous goods handling and transportation, and schedules that include classifications of and special packaging and shipping requirements for particular dangerous goods. In all other situations, consult the provincial regulations to find out whether some or all of the following items are needed:

- shipping documents that indicate the shipper, receiver, technical shipping name, product classification, product identification number (PIN), degree of hazard, and emergency telephone numbers;
- a hazard warning label on every pesticide package;
- placards with product identification numbers and symbols on the outside of vehicles (not required when carrying less than 500kg of a product other than poisonous or corrosive gas, or a substance that produces a flammable gas when mixed with water);
- appropriate packaging of dangerous goods during transport;
- training of persons involved in the transport of dangerous goods; and

- reporting of accidents that represent a danger to health, life, property, or the environment.

Classes and quantities of dangerous goods that require special handling and transport procedures are identified in the Regulations. More details on the transportation of pesticides can be found in Section 3 Transportation.

1.2.2.2 Transportation of Waste Dangerous Goods

Refer to:

- Appendix 17: Federal Government Hazardous Substance Directive; and
- Appendix 14: Provincial Contacts for Transportation of Waste Dangerous Goods.

1.2.2.3 Canada Labour Code

The purpose of the Canada Labour Code, Occupational Safety and Health, is to prevent workplace accidents and injuries. Employers must ensure the safety and health of employees, while they are at work, by complying with the standards in the *Canada Occupational Safety and Health* Regulations. The regulations set out standards to ensure that employees are not endangered by exposure to a dangerous substance while working.

The regulations also require that persons working with dangerous substances receive proper training and that everything is done to minimize the hazard. The Canada Labour Code recognized all dangerous goods classified under the *TDGA*.

A program called "The Workplace Hazardous Materials Information System" (WHMIS) has been developed to educate product suppliers, employers, and employees in the safe use, storage, handling and disposal of hazardous material used in the workplace. These safety procedures may be applied to the storage, handling, and disposal of pesticides.

1.2.2.4 Workplace Hazardous Materials Information System (WHMIS)

The Workplace Hazardous Materials Information System, commonly known as WHMIS or the "Right to Know", is a Canada-wide system designed to provide employers and workers with information about the hazardous materials they work with. The information is provided in three ways:

- warning labels;
- Material Safety Data Sheets (MSDS) providing further detailed information; and
- worker education and training to ensure they know how to access and use the information.

Presently, pesticides are exempted from WHMIS rules on labelling and MSDSs because they are covered under the *PCP Act*.

It is the responsibility of the supervisors of a facility to inform employees about any possible workplace dangers to their health and safety. It is the employee's right to obtain information about substances they work with, including MSDSs where available.

Additional details on Material Safety Data Sheets may be obtained from:

- the pesticide manufacturers or product supplier;
- Canadian Centre for Occupational Health and Safety at 1-800-263-8466 or http://www.ccohs.ca;
- North American Compendiums Ltd., P.O. Box 39, Hensall, Ontario, N0M 1X0. Phone: 1-800-350-0627 or fax (519) 263-2936; and
- Agrichemical Warehouse Standards Association or a member of the Crop Protection Institute at www.awsacanada.com.

1.2.2.5 Treasury Board of Canada Secretariat

Refer to Appendix 17: Federal Government Hazardous Substance Directive for a select outline of requirements.

1.2.2.6 Fisheries Act

The *Fisheries Act* protects fish and fish habitat (spawning grounds, nursery, rearing, food supply, and migration areas). The major provision is that no person shall allow the entry into waters of any deleterious substance that will adversely affect fish or fish habitat, or man's use of fish. The pollution prevention provisions of the *Fisheries Act* are jointly administered by Fisheries and Oceans Canada and Environment Canada. When handling pesticides in areas where there is a watercourse the *Act* must be complied with. The Minister of Fisheries and Oceans Canada may request a complete analysis be performed when any undertaking results in, or is likely to result in, the deposit of a deleterious substance into fish habitat. Furthermore, intentional or incidental deposit of pesticides in waters frequented by fish may constitute a violation of the *Fisheries Act*. This Act considers any substance deleterious unless specifically exempted through an associated regulation.

1.2.2.7 National Fire Code (NFC)

The National Fire Code of Canada (NFC) 1990, provides minimum fire safety requirements for buildings, structures, and areas where hazardous materials, including pesticides, are used, and ensures an acceptable level of fire protection and fire prevention in the ongoing operation of buildings. Part V of the NFC deals with the storing and handling of flammable, combustible and other hazardous materials, which must be stored in such a way that they do not present a fire or explosion hazard. Facilities storing flammable or combustible pesticides will have to meet the provisions set by the NFC. The NFC classification system for hazardous materials is used in determining the placarding for transportation. The Code requires fire safety plans in anticipation of emergencies, reducing the likelihood of fires, particularly those that may present a hazard to the community.

The NFC is in the process of being revised. Federal facilities should obtain a copy when available to ensure they remain in compliance.

1.2.2.8 National Building Code (NBC)

The National Building Code of Canada (NBC) provides minimum requirements for health, life safety and structural sufficiency in new buildings, with specific requirements for facilities that store hazardous materials, including pesticides. The NBC should be consulted before any new construction or for the renovation of an existing facility.

1.2.2.9 Fertilizer Act

The *Fertilizer Act,* administered by Agriculture and Agri-Food Canada, regulates all fertilizers used in Canada, including those that contain pesticides. Before a fertilizer/pesticide can be sold or used in Canada it must be registered under the *Fertilizer Act*. This Act regulates importation and sale of fertilizer and supplement products by prescribing standards, packaging, and labelling requirements, and by providing for the authority to inspect and sample products for legal compliance.

1.2.2.10 Migratory Birds Convention Act

Under the Migratory Birds Regulations in Section 35, subsection 1 regarding pollution, it is stated that "it is an offence to deposit a substance such as oil, oil waste or any other substance in an area that is frequented by migratory birds". Subsection 1 does not apply to deposits according to regulations made by the Governor in Council or in response to the Minister of the Environment provided the deposit is for scientific purposes.

1.3 Provincial Pesticide Legislation

Each province has enabling legislation governing the transportation, storage, sale, handling, mixing, application, and disposal of pesticides within their province. Legislation for the regulation of pesticides varies in approach between provinces, but in all cases it is in addition to, and complimentary to the federal *PCP Act*. While the provincial legislation does not apply directly to activities carried out on federal lands, there is usually cooperation between federal and provincial authorities (refer to the Atlantic Region Pesticide Advisory Committee [ARPAC]).

Federal facilities should be familiar with the pesticide legislation in their respective province and follow the intent of applicable provincial regulations.

In the case of handling of pesticides, the provincial Acts regulate the type of license or permit required for the application and sale of pesticides. The application licenses are divided into several classes depending on the methods of pesticide application and the province in which the applicant applies for the license.

In New Brunswick, Prince Edward Island (PEI) and Newfoundland, public liability and property damage insurance are required by all those applying for an application license. In Nova Scotia, the applicant may be required to post a bond by way of cash or other security; see Appendix 11.

All four provinces have adopted the Basic Knowledge Requirements for Pesticide Education in Canada as prepared by the National Task Force on Pesticide Education, Training, and Certification. The standards recognize ten application certification categories (aerial, agricultural, aquatic, forestry, greenhouse, industrial vegetation, landscape, mosquito and biting flies, fumigation, and structural) and a certification category for pesticide vendors and dispensers. Only certified individuals can purchase, use, or handle a non-Domestic pesticide.

1.3.1 Nova Scotia

In Nova Scotia, pesticides are regulated under the *Environment Act* and the Pesticide Regulations. Copies of the *Act* and regulations can be obtained by calling 1-800-670-4357.

The *Environment Act* is available for download at:
http://www.gov.ns.ca/legi/legc/statutes/environ1.htm.

The Pesticide Regulations can be accessed at:
http://www.gov.ns.ca/just/regulations/regs/env6195.htm.

1.3.2 Prince Edward Island

In PEI, pesticides are regulated under the *Pesticides Control Act*, administered by the Department of Fisheries, Aquaculture and Environment. Copies of the *Act* may be downloaded at: http://www.gov.pe.ca/law/statutes/index.php3. The regulations can be obtained by contacting the Pesticide Regulatory Program at: (902) 836-8924 or by e-mail at: pesticideinfo@gov.pe.ca.

1.3.3 New Brunswick

In New Brunswick pesticides are regulated under the *Pesticides Control Act* and Regulations, administrated by the Department of the Environment and Local Government. Copies of the Act and regulations can be obtained by contacting the Pesticides Management Unit at 1-800-561-4036 or by e-mail at: pesticides@gnb.ca.

1.3.4 Newfoundland and Labrador

In Newfoundland and Labrador, pesticides are regulated under the *Environmental Protection Act* and Pesticides Control Regulations, administered by the Department of Environment. Copies of the Act and regulations can be obtained by contacting the provincial Queen's Printer at: (709) 729-3649 or by e-mail at: qprinter@mail.gov.rtf.ca.

The *Act* and Regulations can be reviewed at: http://www.gov.nf.ca/hoa/sr/.

1.3.5 Municipal By-Laws

Federal facilities should be aware that within some provinces, a municipality may have passed specific by-laws or building codes that place additional restrictions on the location, construction, or operation of pesticide storage facilities, or on the application or use of pesticides. It is important to check with appropriate municipal or county offices for more details.

2.0 PEST MANAGEMENT

2.1 Introduction

The goal of pest management is to manage pests effectively, economically, and safely. Pest management usually involves suppression of pest population to acceptable levels. Federally operated facilities should use an integrated pest management approach, especially if chemical pesticides are to be considered.

2.2 Integrated Pest Management (IPM)

In Canada, the Expert Committee on Integrated Pest Management proposed the following definition for IPM in 1995: "Integrated Pest Management (IPM) is a decision making process that uses all necessary techniques to suppress pests effectively, economically, and in an environmentally sound manner".

IPM is an approach where the manager uses a combination of tools and techniques in an organized program to suppress pest problems effectively, economically, and in an environmentally sound manner. In the past 10 years IPM programs have been developed not only for pest control in agricultural crops, but have been expanded to include pest management in forestry, for lawns and landscape, on rights-of-way, and for biting flies.

An IPM program does not usually try to eliminate all pests, but by using methods that have the least potential to harm people and the environment, is designed to reduce the pest population to a level where damage is acceptable. A central idea of an IPM program is that treatment is only undertaken when pest numbers justify it. Taking unnecessary pesticide use out of a pest management program also reduces the chance of pest populations becoming resistant to pesticides.

2.2.1 Elements of IPM

Elements of an IPM program include:

- prevention, planning, and managing ecosystems to discourage organisms from becoming pests;
- identifying potential pest problems;
- monitoring pest populations, beneficial organisms, pest damage, and environmental conditions;
- using injury action thresholds in making a treatment decision;

- using a range of strategies that might include a combination of biological, physical, cultural, mechanical, behavioural, and chemical controls to reduce the pest population to acceptable numbers;
- evaluating the effectiveness of the treatment; and
- keeping records.

2.2.1.1 Prevention

Prevention is the true foundation of any IPM program and facilities should undertake every possible action to prevent pest problems. Many of the pest treatment methods categorized as cultural or physical could also be considered as preventative. This can be as innovative as choosing the right plants for the site and then giving them the best growing condition, selecting disease or insect resistant plants, managing growing conditions to produce healthy plants, cleaning to eliminate food sources for pests, or screening buildings to keep out pests. Reducing pest problems through preventative steps also makes any pest treatments more effective if they are ever required.

2.2.1.2 Identification

Identification involves the correct identification of pests and beneficial species, minimizing the chance that beneficial species may be mistaken for pests. This then allows for the applicator to determine the correct timing and method of control.

Important biological information to know:

- the life cycle and stages of growth of the pest;
- how rapidly the pest species reproduces;
- how rapidly beneficial species reproduce; and
- the behaviour of the pest.

2.2.1.3 Monitoring

Monitoring can provide information about levels of pest populations facilitating pest management decisions such as whether treatments are needed, or when they will be the most effective. It is also important to monitor the presence of beneficial predators, pollinator insects, and to note local weather conditions. The accurate assessment of pest infestation levels is an essential component in determining if pest numbers exceed the economic threshold and determining whether or not control measures are warranted.

2.2.1.4 Action Decisions

The operator should make decisions as to when to apply a treatment based on monitoring information that determines the injury threshold and the action threshold for the pest.

2.2.1.5 Injury Threshold

Pest treatments have financial costs, and may have impacts on wildlife, fish habitat, or beneficial species that must be considered against the benefit of treatment. The injury threshold is when a pest population reaches numbers such that it causes unacceptable injury or damage.

2.2.1.6 Action Threshold

The action threshold is the point at which treatment should take place in order to prevent the pest population from reaching the injury threshold.

2.2.2 Treatment Categories

IPM involves using all available information to select methods of treatments and then applying them in a coordinated approach. Most treatments fall into the following general categories:

- The cultural category includes treatments that can prevent pests from developing or spreading. They may disrupt the pest or host life cycle, or make the environment less favourable for survival of the pest. They include rotating crops, tilling the soil, providing optimum plant growing conditions, sanitation practices, and the replacement of plants susceptible to infestation with more resistant cultivars or species.
- The mechanical/physical category includes treatments that use equipment or devices or the manipulation of environmental factors such as temperature and humidity to prevent the spread of pests or reduce pest populations. This category includes the use of mechanical cultivators, mowers and brushing equipment, traps, screens, vacuums, freezers, heat applicators, sound, or other repellent devices.
- The biological category includes treatments that use living organisms to control or kill the pest.
- The behavioural category includes treatments that take advantage of a pest's natural behaviour to suppress the population. These include using pheromones (which are chemicals produced by insects to repel or attract other insects of the same species) to disrupt mating patterns or to attract pests to a trap or releasing sterile males to inhibit pest reproduction.

- The chemical category includes treatments that use naturally derived or synthesized pesticides to kill, attract, repel, or alter the growth of pests. Pesticides are categorized according to their properties such as selective, non-selective, residual persistent, and non-persistent.

2.3 Choosing a Product

After a pest has been identified and it is determined that a pesticide is required, the pesticide to be used must be chosen. Different pesticides vary in their efficacy, persistence in the environment, selectivity and toxicity to non-target organisms. Detailed information on the product is available from the manufacturer or contained on the pesticide label. Some pesticides are available in different formulations, which can affect the way in which a pesticide must be handled in the environment. The ability to effectively combat the pest infestation is the first requirement of a pesticide. Within the options of effective pesticides there is often a range of products or formulations to choose from that will minimize handling and disposal problems as well as the impacts on non-target organisms. In some cases special environmental sensitivities must be considered. For example, when applying a pesticide near a water body, the toxicity of the product to aquatic organisms becomes very important.

2.4 Environmental Considerations Before Treatment

Observing and recording environmental conditions at or near a proposed treatment site will help when making treatment decisions. Environmental conditions can influence the effectiveness of the treatment and its safety (environmental and human). Environmental considerations are particularly important for pesticide treatments, but may be important for non-pesticide treatments as well. Environmental conditions to observe include: temperature, relative humidity, precipitation, air movement, nearby sensitive areas, and topography.

2.5 Record Keeping

Good record keeping is essential and can provide an applicator with a detailed history of pest problems, results of control methods used, and details on pest control equipment settings (pump pressure, speed, nozzle types, etc.). Operators should also keep records on the meteorological conditions (wind velocity, ambient temperature, relative humidity, and time since last rain). Keeping records can be useful for planning future applications, evaluating products, equipment settings, and determining re-entry times. Review of past records may help answer questions and solve problems that come up after an application (*e.g.*, ineffective applications, adjacent crop or property damage, or liability suits).

3.0 TRANSPORTATION

3.1 Introduction

Hazardous materials such as pesticides can present severe environmental and health problems if accidents occur during transportation. Pesticides spilled while being transported on the roadway may be involved in fires, enter surface water or ground water, be blown onto nearby agricultural crops, and be scattered by passing vehicles.

Federal and provincial governments work together to enforce regulations designed to prevent and minimize the risk from the transport of pesticides. It is important to follow these regulations and transport pesticides in such a manner as to minimize the chance of accidents and take the necessary steps to reduce the risk when an accident occurs.

3.2 Transportation of Dangerous Goods

The transportation of pesticides is regulated under the *Transportation of Dangerous Goods Act TDGA* located at http://laws.justice.gc.ca/en/T-19.01/index.html at the federal level. The *TDGA* regulates the responsibilities of the shipper (consignor), the carrier, and the receiver (consignee). The shipper is responsible for classifying the dangerous goods and ensuring that the packaging meets safety standards and displays appropriate safety marks before leaving the storage facility. The shipper must also provide the initial carrier with complete required documents and the appropriate placards. The carrier is responsible for displaying the safety marks in the proper manner and location. The carrier must ensure all required documentation is complete and accompanies the consignment.

The *TDGA* requires that personnel handling, offering for transport or transporting dangerous goods must be trained and possess a certificate of training or be under the direct supervision of a trained person. The receiver is responsible for notifying proper persons of leaking or damaged containers received and meeting the requirements of a shipper when returning empty packages, containers or vehicles that are not cleaned. Copies of the shipping documents should be kept for a period of two years by the shipper, the carrier, and the receiver.

3.2.1 TDG Classification

The labelling, placarding, and documentation required during transportation will depend on the classification of the material. The first step then in the transportation of dangerous materials is to determine if the material is regulated by the *TDGA*. The *Act* classifies dangerous goods into nine classes and numerous divisions within these classes, which reflect the hazard or risk the goods represent. Hazardous products registered as pest control products are classified under a number of different classes including explosives (class 1.4), flammable gases (class 2.1), flammable liquids (class 3), flammable solids (classes 4.1 & 4.3), oxidizing substances (class 5.1), poisons (class 6.1), corrosives (class 8), and products hazardous to the environment (class 9.2). All other products are classified as "not regulated".

Croplife Canada provides a list of the products registered in Canada according to their TDG classification and National Fire Code on their internet site. This list can be accessed by searching the resources heading on http://www.awsacanada.com/. An example page is reproduced in Appendix 19.

3.2.2 Shipping Requirements Under *TDGA*

The Class of the product must first be determined before it can be transported to establish whether some or all of the following items are required. If the quantity and class of product is a regulated product under *TDGA*, then all of the following are required:

- shipping documents that indicate the shipper, receiver, technical shipping name, product classification, product identification number (P.I.N), the degree of hazard, and emergency telephone numbers;
- a hazard warning label on every pesticide package;
- placards with product identification numbers and symbols on the outside of vehicles (not required when carrying less than 500 kg of a product other than poisonous or corrosive gas, or a substance that produces a flammable gas when mixed with water);
- appropriate packaging of dangerous goods during transport;
- training of persons involved in the transport of dangerous goods; and
- reporting of accidents that represent a danger to health, life, property or the environment.

Commercial pesticide applicators that transport pesticides from storage areas to application sites or to other storage sites should be familiar with the requirements for the specific pesticides they handle; see Appendix 16.

4.0 STORAGE AND HANDLING OF PESTICIDES

4.1 Introduction

The objective of every federal facility should be to make sure that pesticides are stored as safely as possible for the employees, for the community, and for the environment. This can be addressed through the proper siting and construction of the facility, employment of emergency response procedures and equipment, education and training of the staff, notification, and controlled operation of the facility.

4.2 Location of the Storage Site

Criteria for selecting the site for the storage of pesticides should take into consideration possible risk to surface water, ground water, and adjacent property if there were to be a major spill or a fire at the facility.

Provincial requirements for storage facility locations vary and provincial legislation and/or regulations should be consulted prior to pesticide storage.

- In Nova Scotia: the Pesticide Regulations, made under Section 84 of the Environment Act S.N.S. 1994-95, c.1 O.I.C. 95-300 (April 11, 1995), N.S. Reg. 61/95
- In New Brunswick: New Brunswick Regulation 96-126 under the Pesticides Control Act (O.C. 96-1138)
- In PEI: Regulation 2/k, Water Well Regulations, 1988, under section 25 of the Environmental protection Act R.S.P.E.I. 1988, Cap. E-9.
- In Newfoundland and Labrador: Regulation 57/03, Pesticides Control Regulations, 2003, under the Environmental Protection Act (O.C. 2003-224).

4.3 Design and Construction

Proper storage facility design and construction can reduce the likelihood of an accident and minimize the damage resulting from an accident. When designing a pesticide storage facility be sure to comply with the national building, fire, and electrical codes, and any provincial or municipal requirements.

The pesticide storage facility and any connecting buildings should have a fire detection system throughout that is ideally connected to a 24 hour monitoring station.

4.4 Emergency Safety Equipment

The following safety and emergency response equipment should be available and in good working condition to allow the operator to safely respond to an accident:

- an aluminum shovel, absorbent material, chemical resistant gloves and rubber boots, goggles, respirator with chemical cartridges, and a sealable salvage container for addressing spills;
- a first aid kit to address minor injuries;
- an eye wash station; and
- ready access to a minimum 2-A:10-B:C portable fire extinguisher installed within 9m or a minimum 2-A:20-B:C extinguisher within 15m travel distance to the extinguisher.

4.5 Loading and Unloading Facilities

Spills and accidents can happen while unloading, handling or loading product. To reduce the risk, the loading dock should be designed to be level with the loading vehicle to minimize the lifting of pesticide containers. If this is not possible, a well maintained dock leveler or loading plate should be used. Wheel chocks should be provided when a forklift is used. Pesticide containers should never be dropped, dragged or rolled from one level to another. Proper loading and unloading equipment such as a forklift should be used to unload or load heavier pesticide containers. All forklifts or product handling equipment should be in good working condition. To facilitate the loading and unloading process ensure that sufficient lighting is either attached to the handling equipment or the facility. The floors, ramp, and access areas leading from the unloading area to the storage area should be clean, tidy, and free of obstructions. Precautions should be taken to avoid puncturing pesticide containers.

4.6 Outside Storage

Only pesticides in weather-proof packaging, such as 200L drums, should be stored outside and then only on a temporary basis and where continuous security can be guaranteed. Check to make certain that their contents are not sensitive to high or low temperatures. The drums should be stored on a firm, impermeable base surrounded by a containment sill or berm of a size that will provide containment of up to one and a half times the volume of the pesticide stored. The drums should be upright on pallets or if this is not possible, on their side, but tied or strapped down. It is also important to place the drum in such a way that fire fighters have sufficient access to the area. Notify the local fire department and invite them to visit this temporary storage site. Where practical the area should be surrounded by some sort of barrier to restrict access to unauthorized personnel and warning signs posted. A complete set of emergency equipment as required for permanent storage sites should be located at all sites where product is being routinely handled. This would include adequate fire extinguishers, a spill clean-up kit, an eye wash station, list of emergency phone numbers, and sets of personal protective equipment including respirator and chemical cartridges.

4.7 Handling and Receiving Product

When pesticides arrive at the storage facility, they should be accompanied by the documentation required by the *TDGA* and an MSDS provided by the supplier in accordance with Labour Canada's, *Occupational Safety and Health Act.* The MSDS provides product identity information, information on hazardous ingredients, physical data, fire, explosion and reactivity data and toxicological properties, as well as providing prevention and first aid measures. The MSDS will allow the receiver to identify the type of pesticides received, any special emergency precautions for fire or spill, and allow them to be stored in compliance with the Separation Chart for Storage of Dangerous Goods (Appendix 19) according to their different hazardous properties; *e.g.,* flammability, combustibility, corrosivity, and toxicity.

The receiver should update the pesticide storage inventory on receipt of each shipment.

4.8 Operating Rules and Staff Training

As a minimum a written set of general operating rules and employee training requirements should be developed by each facility. These rules should include but not be limited to the safe operating procedures for each job, development of an Occupational Health and Safety training program consisting of:

- safe work permits for confined workspaces entry, hot work and lock out;
- information on the rights of employees to refuse unsafe work;
- responsibility of management and employees under the appropriate labour legislation; and
- the use of an eye wash station.

Staff training should include training on the *TDGA* and Regulations, lift truck training for the forklift operator, WHMIS/MSDS training for all employees handling pesticides, training for appropriate staff in first aid, cardiopulmonary Resuscitation (CPR), and handling of fire extinguishers. Training frequency is noted in Appendix 3.

4.9 Routine Inspections and Documentation

A faulty electrical connection, an undetected spill, an empty eye wash station, or a poorly maintained fire extinguisher all could add to the risk in a pesticide storage area. To maintain a low level of risk federal facilities should initiate self-audit programs for the storage site and for the staff. This could be accomplished by implementing a program of monthly, semi-annual, and annual checks. Examples of check lists for the facility and for staff training are provided in Appendices 4 and 5.

An inventory describing the types and quantities of pesticides in storage should be maintained and copies kept in at least two places, one of which is removed from the storage site and accessible in cases of emergencies. In most provinces in the Atlantic Region a list of potential inventory (PCP Number and quantity) must be forwarded by pesticide vendors to the local fire department annually as a requirement for license renewal.

5.0 MIXING, LOADING, APPLICATION AND DISPOSAL OF PESTICIDES

5.1 Mixing and Loading Pesticides

Many pesticide accidents occur when pesticides are being mixed for use. The most dangerous work with pesticides is pouring and mixing the concentrated products. Mixing and loading organophosphorous and carbamate insecticides can present a serious safety hazard, particularly when they are formulated with the solvent xylene that promotes their absorption through the skin. A few common-sense rules can reduce the hazard involved in mixing and loading pesticides:

- before mixing a pesticide, read the product label and double-check the safety precautions;
- wear the correct protective clothing including rubber boots, chemical-resistant aprons, coveralls and gloves, a face shield, a hat and possibly a respirator;
- have emergency wash facilities, first aid equipment, and emergency phone numbers close at hand;
- mix pesticides only in good light and with adequate ventilation, preferably outdoors under low wind conditions, stand upwind to minimize airborne exposure;
- when pouring a pesticide concentrate keep the container well below eye-level to prevent splashing or spilling any pesticide in your face or eyes;
- do not tear open paper bags as this may spill contents, instead use a sharp knife to open bags and clean the knife after use;
- to reduce airborne dust and for better mixing, pre-mix wettable powders with a small amount of water before addition to the mixing tank to make a slurry then pour it into the spray tank;
- when transferring quantities of flammable materials (such as pesticides formulated with xylene or kerosene) from drums, it is essential to prevent sparking due to static build-up, grounding procedures may be necessary;
- if you splash or spill a pesticide while mixing or loading, stop immediately;
- speed is essential when you or your clothing is contaminated;
- remove contaminated clothing and wash thoroughly with detergent and water;
- obtain medical assistance if exposure could result in more than a mild irritation; and
- clean up any pesticides spilled.

5.1.1 Closed-Handling Systems

Closed-handling systems can reduce the applicator's exposure to concentrated pesticides. A closed-handling system is interconnected equipment that allows the applicator to remove a pesticide from its container, rinse the empty container, and transfer the pesticide and rinse solution to the spray tank without handling an open heavy container. Closed-handling systems have several advantages including increased applicator safety and a reduction in spills. There are two types of systems:

- gravity systems are sometimes called "punch and drain" systems; and
- suction systems use a pump to remove the pesticide through a probe inserted into the container.

Closed-handling systems are not yet widely available but should be used wherever possible.

5.1.2 Cross-Contamination

Cross-contamination is another hazard during the mixing of pesticides. It results when water is being added to a pesticide and the pesticide is drawn back into the pipe system supplying the water. Cross-contamination may occur in two ways:

- Back-pressure or backflow is a reverse flow of water caused by a reduction in water pressure. If the hose used for adding water is immersed below the level of the pesticide mix in the spray tank, back-pressure may draw the pesticide mix back into the main supply line. Water downstream of the main supply line will then be contaminated. Back-pressure can occur when there is a large draw on the main supply line such as for fire-fighting or due to a break in the supply line.

- Back Siphoning is a reverse flow that occurs when systems such as mixing tanks are above the height of the water supply source. For example, a pump may supply water from a pond to a mixing tank on a truck. If the pump fails, back-siphoning could cause the pesticide mixture to flow through the supply line into the pond.

The simplest method of preventing backflow is to maintain an air gap between the discharge end of the supply line and the pesticide in the mixing tank. When this is not possible it is extremely important and in some provinces a requirement to use a backflow prevention device or a one-way valve to prevent a reverse flow of a pesticide from a spray mixing tank into a water supply in the event a pump fails. These devices must be tested upon installation and on an annual basis.

5.1.3 Compatibility

Compatible pesticides are those that can be mixed together to control a wider range of pests with a single application. Not all pesticides are compatible. Pesticides that are not compatible can cause loss of effectiveness, injury to treated plants or animals, and settling out of solids creating a non-sprayable mixture.

Some combinations of pesticides are registered as "tank mixes", with clear use instructions on the labels and supporting data on physical compatibility, efficacy, safety, and residues. Some pesticide labels state that the pesticide is "compatible" with other pesticides. While pesticides should certainly not be mixed together unless their compatibility is stated on the label, such statements are only indicators of physical compatibility. They do not guarantee that mixing will have no effects on the safety, efficacy, or residues of the pesticides that are mixed.

5.2 Label

5.2.1 General

The pesticide label, defined in the *PCP Act* as: "any legend, word, mark, symbol or design applied or attached to, included in, belonging to or accompanying any control product", is a legal document. Information on the label identifies the manufacturer and tells how a product must be used. It is illegal to use it in any other way, to use it in an unsafe manner, or for a vendor to tell a customer that a pesticide can be used for any purpose that is not on the label. In addition to the information found on a label, manufacturers often provide extra product information. These materials (*e.g.,* pamphlets, brochures, advertising) complement the label, but do not legally substitute for the label. The manufacturer may also print information on the wrapper, or on stickers or tags that are attached to the container.

Check all products to make sure they have a legible label with a valid PCP Number.

5.2.2 Principal Panel

There are nine components on the principal label panel: the trade name or product name, class designation, net content, read the label directions, warnings, precautionary symbols, guarantee statement, registration or PCP Number, and name and address of the registrant.

5.2.3 Formulations

Pesticides are manufactured as formulations that can be in liquid, solid or gaseous forms. Many pesticides are available in different types of formulations or forms. The specific formulation of many pesticides is indicated by an abbreviation that appears on the product label. A formulation is a mixture of active ingredient(s) with inert ingredients. The inert ingredients can include carriers and adjuvents that are mixed with the active ingredient to make it suitable for storage or handling, or to improve the effectiveness to control the pest. The active ingredient is the chemical part of the formulation that produces the desired effect on the pest.

5.2.4 Secondary Panel

There are seven components on the secondary display panel:

- directions for use;
- precautionary statements;
- disposal, first aid instructions;
- toxicological information;
- notice to user, and;
- notice to buyer.

Directions for use, that include the pest to be controlled, the area to be treated, method of application, rates, timing, and re-entry directions must be followed exactly. The label is the most readily available source of information on first aid.

Before purchasing, applicators should check the label for any restrictions on methods of application such as “Do not aerially apply” or environmental concerns including “Highly toxic to bees or fish”.

5.3 Application of Pesticides

Attention to a few simple guidelines during pesticide application will make the job much safer:

- Before starting to apply a pesticide, read the label. Do not trust your memory for details concerning the use of pesticides. The label of a recently purchased product may differ from the label of the same product purchased some time ago. Make certain you are aware of the current use directions and precautions.
- Check the application equipment. Look for leaking or worn hoses and connections. Examine nozzles to make sure they are not plugged or the opening is worn.
- Before you begin, make certain your protective equipment is appropriate for the hazard.
- Make sure that emergency facilities such as wash water are at hand in the event of an accident.
- Before applying pesticides ensure that appropriate warning signs are posted at normal points of entry to the treatment site so that unprotected workers or bystanders are not exposed. It is also advisable to notify residents near treatment areas so they can keep children and pets away. Ensure safe re-entry periods are observed. Check with provincial requirement for posting of an area and re-entry times.
- Avoid working alone when handling highly toxic pesticides.
- Follow the label requirement for application rates and special mixing requirements.

5.4 Record Keeping

A well-managed pesticide program includes a record of applications. Proper records provide information on a treatment location, size of treatment, pest controlled, pesticide name, application rate, application equipment, total pesticide used, dates of application, and weather.

5.5 Equipment

5.5.1 Calibration

Calibration is a procedure for checking and adjusting the delivery rate of application equipment. Properly calibrated equipment will deliver the correct amount of the pesticide to the treatment area, in a uniform distribution, when the equipment is operated properly. Equipment that is not properly calibrated may apply the pesticide at an incorrect rate or in a non-uniform distribution, thereby resulting in areas of over, or under application. Calibration procedures for specific application equipment may be outlined in the operator manual or recommended by industry or government specialists.

To calculate how much total product the customer will need to purchase, multiply the amount of formulated product times the size of the area to be treated.

5.5.2 Sprayer Maintenance

Regular inspections and maintenance of pesticide application equipment will significantly reduce the potential for spills or accidental discharges. The chance of parts failing can be reduced by regular inspections and maintenance on the spray equipment. Operators should put on the appropriate personal protective equipment (including: hard hat, eye goggles, long-sleeved coveralls, and impermeable gloves) before undertaking any inspection or maintenance of the spray equipment. Worn or cracked hoses should be replaced and all connections tightened. Plugged nozzles should be removed by an operator wearing gloves and cleaned with a soft brush, never held to the mouth and blown clean. The sprayer will have to be recalibrated if there are any changes made to the equipment, pump pressure, or replacement of nozzles.

5.5.3 Procedure for Washing Spray Equipment

Operators must wear appropriate personal protective equipment (including: hat, eye goggles, long-sleeved coveralls, impermeable gloves, waterproof boots, and a waterproof apron) before cleaning the spray equipment. Procedures for cleaning the sprayer should include the following:

- dilute spray residue by filling the tank with water and circulating it through the sprayer;

- remove all strainers and nozzles and clean each piece thoroughly;
- drain the spray solution from tanks, hoses, booms, pumps, and strainers;
- rinse the entire system thoroughly with clean water;
- fill the sprayer completely with water, circulating it through the entire system, and drain completely;
- fill the tank with water then add 1L of household ammonia per 100L of tank capacity; one-half a kg of Nutrasol, Solventol or lye, or 1kg of trisodium phosphate per 100L of tank capacity may be used instead of household ammonia;
- circulate to ensure the solution contacts all the internal parts of the sprayer;
- allow the solution to remain in the tank and hoses overnight;
- the following day, recirculate the entire system, remove end caps on the booms and then drain completely into approved containers;
- rinse out twice with clean water, recirculating and draining each time;
- replace the nozzles and check all connections and hoses; and
- collected rinsate must be disposed of according to directions provided by the local Department of Environment.

5.6 Disposal

5.6.1 Unwanted Product

The safest way to dispose of a pesticide concentrate is to use it according to label directions. Product left in the tank at the end of an application should be applied according to label directions on another field or site that requires an application of this pesticide. Never put this product back into another container. Referring to previous spray records, following procedures for calibration, and checking the calculations should minimize the likelihood of excess product at the end of the application. Some vendors will take back unopened containers as a service to their customers. If a mixed formulation cannot be applied it should be disposed of through a disposal service, refer to Section 10 of Part III; the Commercial Hazardous Wastes Services for a list of disposal services. Contact Environment Canada for more product specific disposal directions.

5.6.2 Rinsing

Applicators should be aware that once the pesticide has been added to the spray tank, the container should be rinsed (triple or jet rinsed for plastic or metal containers, and single rinse for bags with plastic or foil liners) to remove any remaining pesticide and the rinsate should be added to the formulation. Even after rinsing, trace amounts of a pesticide may remain. All containers not being recycled should be punctured or crushed so that they cannot be used again for any other purpose.

5.6.3 Empty Containers

Applicators should contact the provincial regulatory authority for information on the proper method of disposal for empty pesticide containers, read the label, and follow all precautionary statements. Applicators should be aware that burning of plastic containers or a hazardous substance is prohibited. The burying of empty pesticide containers, even if they have been properly rinsed, is not recommended and may be against the law in some provinces.

In all provinces the recommended way to dispose of empty, rinsed plastic pesticide containers is to return them to an authorized pesticide vendor for recycling. Licensed pesticide dealerships accept plastic containers (up to 23L) during normal business hours. Containers must be clean, rinsed (triple or jet), and contain no liquid material. Container lids must be removed and, if possible, pesticide labels should also be removed. Dealer personnel will inspect each container to make sure that it is acceptable for recycling. Dealers will not accept cardboard boxes, paper bags, barrels, or drums, or containers that are not completely empty, have not been properly rinsed, or contained domestic pesticide. Containers collected in the Maritime Region are chipped and the plastic chips are shipped to Ontario to be made into products such as plastic fence posts. Contact the provincial regulatory authority or the Crop Protection Institute for a list of authorized collection sites in your area.

6.0 ENVIRONMENTAL FACTORS

6.1 General

Both surface water and groundwater can be contaminated by pesticides. Once water is contaminated with pesticide, it may be toxic to marine, aquatic, or terrestrial wildlife, domestic animals, or humans, or cause damage to sensitive crops from runoff, or when used as irrigation.

Once water is contaminated, organisms living in or using the water may be affected. These can include people, domestic animals, people, fish, plants, birds, wildlife, or other organisms. The water can affect them directly (contact or drinking) or indirectly (impact on food supply or recreational activities). It is very difficult (sometimes impossible) and very expensive to decontaminate ground and/or surface water. Vendors should be aware that soil can be contaminated in the same way as water, by spills associated with mixing and loading, application equipment overflow, improper disposal, or if the applicator exceeds the proper rate of application. Contamination of sandy or coarse soils can lead to the contamination of groundwater, whereas spills on clay or fine soils often remain on the soil surface longer and are more likely over time to move to other areas by surface runoff.

6.2 Drift

Spray droplets, dust, mists (spray drift), or vapours (vapour drift) can be added to the air during ground or aerial spraying potentially contaminating areas adjacent to the application site.

6.2.1 Spray Drift

Spray drift is the airborne movement of spray droplets away from a treatment site during application. Spray drift is affected by:

- spray droplet size (the smaller the droplet the more likely the product is to drift);
- air movement (the more that air moves, the more pesticide spray will drift);
- stable or stratified atmospheric conditions such as inversions (inversions occur when wind is calm and air temperature at the ground level is lower than the air above it); inversion causes spray to remain suspended, then when wind does start, the suspended droplets move as well;
- the distance between the nozzles and the target (the greater the distance, the more that air movement can affect the spray); and
- the speed of application equipment (the faster that application equipment moves, the more likely wind shear effects will occur).

6.2.2 Vapour Drift

Some pesticides are volatile and turn into the gaseous state more rapidly at the nozzle orifice when the temperature at the application site is higher. This vapour then is subject to being carried by the wind, reducing the effectiveness of the application, and subjecting adjacent areas to contamination. Be sure to consult the label directions for warnings as to the maximum temperature for applying these products.

6.2.3 Ways to Reduce Vapour and Particle Drift

In addition to following the label directions it is important to:

- use the lowest possible recommended application rate that will do the job;
- release spray as close to the ground as possible;
- use a slow speed for motorized application equipment;
- use nozzles and pump pressures that do not generate fine droplets;
- do not apply pesticides when wind will cause substantial drift; Consult the label and provincial directions for maximum acceptable wind speed. If winds come up during application, stop immediately, and do not resume the application until wind conditions improve;
- minimize the chance of vapour drift, do not apply pesticides when temperatures exceed 25°C or any maximum temperature specified on the label or by provincial regulations.

6.3 Meteorological Conditions

Applicators should consider environmental factors before applying pesticides as certain weather conditions will increase the likelihood of impacting on the environment (including: pesticide drift, run-off, vapour drift, leaching, etc.). Generally, it is recommended that pesticide applications be undertaken when wind speeds at the application site are between 2-10 km/hour; the air temperature on the day of application is not predicted to exceed 25°C; relative humidity should be above 50%; and, the application should not occur within 4 hours of a rainfall event or 4 hours before a predicted rainfall event.

7.0 EMERGENCY RESPONSE PLANNING

7.1 Introduction

There is a potential for high risk associated with distributing, transporting, or storing of pesticides and facility staff must be prepared for emergencies such as poisonings, minor or major accidents, vehicle accidents, spills, or fire. Three steps to making a pesticide facility as safe as possible for employees, the community, and the environment include:

- identification of all possible areas of risk (Risk Assessment);
- implementation of measures that should reduce these risks; and
- development and installation of a plan of action that should minimize the risk, should an accident occur.

The objective is to reduce the loss of assets and to protect the community, the environment, and the public.

7.2 Risk Assessment of Facility

A Risk Assessment of the facility will answer the question of what are the unwanted events that can occur at the site that could cause harm to the facility, the employees, the community, or the environment. The most likely would be a fire, spill or major injury to an employee; see Appendix 1 for a framework to assist in identifying the risks, the consequences, mechanisms for reduction, and actions for control.

7.3 Emergency Response Plans

An Emergency Response Plan (ERP) should be designed to give specific instructions for responding and dealing with a variety of emergency events. This Plan and procedures would then be used in training, indoctrination of new employees, and in practice sessions to develop the abilities of all employees to act responsibly and properly in any emergency.

The instructions for the various emergencies should be organized in the order in which they will be needed in the event of an emergency situation. Employees must be familiar with the emergency equipment and supplies, their location, and above all they must know the location of the fire extinguishers, and protective equipment nearest to their normal work location.

7.3.1 General

The facilities written ERP should include the following:

- an organization chart with responsibilities of each position on the chart;

- the telephone number of all emergency responders, employees, local medical facilities, government agencies, and product suppliers;
- notify the Federal Environmental Emergencies department of environmental emergencies by calling 1-800-565-1633;
- a drawing of the storage site plan indicating emergency response equipment, containment, control centers, and emergency routes;
- a written contingency plan to deal with fire, spills, vehicle accidents, employee injuries, and the volume of contaminated firefighting or spilled liquids;
- the distribution list for the ERP; and
- a list of events that initiate the ERP.

7.4 Organization Chart and Responsibilities

7.4.1 Emergency Response Team

Individuals at the facility should be appointed as Emergency Response Chief, Communications Chief, and Site Security Chief. Additional staff can be appointed to the Emergency Response Team as required and as available.

7.4.2 Emergency Response Chief

The Emergency Response Chief is the overall coordinator of the emergency response function with responsibilities that should include the following:

- preparation of emergency response plan;
- ensure staff are trained and familiar with emergency procedures, evacuation procedures, storage, facility shutdown, and first aid;
- coordinate a rapid, orderly, safe shutdown of all site operations in the event of an emergency, including closing of all doors;
- coordinate or supervise countermeasures during an emergency;
- ensure an up-to-date database on all the facility's products, *i.e.,* MSDSs that will help make initial information on toxicological and chemical hazards readily available;
- ensure that the surface water collection system and controls are set to ensure no contaminated water leaves the site;
- coordinate the on-site and off-site monitoring of air, water, or other samples to track down any dispersion of material released from an incident; and
- coordinate the first line response for fire fighting, rescue, and spill control and maintain fire fighting and pollution control equipment.

7.4.3 Communications Chief

The principal role of the communication chief is to provide information to the media, communicate with municipal services, and provide additional support to the field operations. In the event of an emergency their responsibilities could also include the following:

- ensure that all outside agencies are contacted including: contact of the local police to request assistance when off-site road traffic control is required, and requests for ambulance services when required. In the Maritimes call 1-800-565-1633. In Metro Halifax call the Emergency Response Line at 426-6030;
- request shut down of electrical services, and communication with hospitals, doctors, and Canutec to obtain special information on medical, hygiene, toxicological, and environmental matters;
- notify hospitals and medical support people as appropriate about the nature of the emergency and provide all pertinent technical facts on all products involved, with emphasis on their special toxic and biological hazards;
- contact the Department of Environment and manage all environmental issues;
- record names of all persons entering and leaving the site during an emergency, control vehicle and pedestrian traffic to and from, and arrange transportation of injured to local hospitals as required;
- be the official spokesperson for the facility, ensure that all required communications are done on a timely basis, and prepare releases of information to the public during the incident and after.

The ERP should be initiated by anyone who detects the escape of a hazardous material (liquid, gas, solids or unusual odour) that is judged by those present to be a concern or a threat to those in the immediate area, in other parts of the site, in neighbouring areas outside the facility, or to the environment.

The individual who activates the alarm will then announce the location and nature of the emergency via the established method of communication. The emergency announcement should be repeated if possible. In the event of an incident (fire, serious injury or fatality, major spill, or natural disaster), the Emergency Response (ER) Chief or his designate will call the fire department, police, ambulance services, and the Provincial Department of the Environment to inform them of the incident. In the Maritimes call 1-800-565-1633. In Metro Halifax call the Emergency Response Line at 426-6030.

The ER Chief will instruct the Team Members to take remedial action depending on the incident until the Fire Department arrives. The ER Chief and Fire Chief will assess the situation and determine if an evacuation of part of the community is required or if containment must be initiated to minimize damage to the environment.

7.4.4 Site Security Chief

The principal responsibilities of the site service chief are coordinating the withdrawal of all employees on site to a safe assembly area, counting the number of staff and visitors in the assembly area, accounting for and ensuring the safety of all, arranging a search of all buildings if required, and supervising the evacuation of the site when called for. Additional responsibilities include:

- ensure that emergency communication systems are in constant readiness, they have the phone number of an electrician, know where to get additional soil for containment and dyking material equipment, and that emergency medical supplies are stocked at the facility;
- assist with other emergency personnel in arranging call-in of support staff and other resources during an emergency; and
- overall control and co-ordination of site access (and departure), physical security of the site during an emergency, and ensure the site is secure against entry by unauthorized people.

7.5 Site Plan

See Appendix 7: Federal Pesticide Storage Contingency Plan

7.6 Security

During an emergency, all buildings are to be locked and secure. This is the responsibility of the ERP Security Chief.

7.7 Communication

Communications will be verbal during an emergency. Communications to the public (media) is the responsibility of the manager of the facility (Communications Chief). The objectives of the external (and some of the internal) communications activities are to ensure that accurate information reaches the right people in order to:

- protect lives and property;
- advise the proper government agencies;
- alleviate speculation and rumour; and
- maintain community support for the storage facility.

Media are not allowed beyond safety lines set up by the ER Team or Fire Department; press conferences are to be conducted at the Control Centre.

7.8 Evaluation of Seriousness

An evaluation of the seriousness of the emergency must be made quickly in order to bring sufficient and appropriate resources into action to deal with the emergency. The assessment of the emergency will be made on the basis of:

- Severity - the nature, size, and extent of the problem.
- Urgency - whether it has the potential to escalate quickly.
- Threat - whether the effects and the risk of damage might become significant.
- Impact - whether the effects are to people, the environment, property, or the facility.

If based on the assessment, an evacuation of the employees must be effected, the appointed ER Team member will manage the evacuation of the staff to a location noted on the posted map and perform a head count of employees and visitors to ensure all people are out safely.

All employees will be notified through an alarm or directly.

If required, the responsible ER Team member will shut down the utilities, will instruct truck drivers to remove their vehicles away from the storage facility to a designated area, and will determine when employees can remove their vehicles from the property.

ER Team members will meet at the Control Centre (select a suitable location for the Control Center) periodically to meet and record the happenings of the emergency.

7.9 Emergency Response Plan for a Fire

The ERP can be initiated through the activation of a fire or detection unit in the storage facility through the 24 hour monitoring station system.

7.9.1 Instructions to Fire Fighters

Fire fighting experts should always be called to fight uncontrolled fires. The following are some guidelines for fighting fires involving pesticides:

- everyone that might be exposed to fumes or smoke fighting the fire or doing the investigation following the fire should wear chemical-resistant gloves, boots, full-body protective clothing and a self-contained breathing apparatus;
- wherever possible the fire should be fought from the upwind side, using foam or carbon dioxide rather than water, some pesticides can ignite or emit toxic gases on contact with water. If water is used, keep it to a minimum;

- excess water will spread pesticide contamination; dykes may have to be constructed to prevent the flow of water and pesticides into sewers, irrigation waters, or streams;
- apply water with a fog spray rather than a straight stream to avoid breaking bags and bottles; dust from broken bags can be explosive;
- all fire fighters and first responders should wash before eating, drinking, smoking, or using the toilet;
- if anyone is exposed to smoke and fumes, exposed body areas should be washed as soon as possible at the fire site. If anyone has symptoms of pesticide poisoning, consult medical authorities immediately; and
- once the fire is out, apply decontamination procedures to all fire fighting equipment, personal protective equipment, and any contaminated land.

7.9.2 All-Clear

The decision that the emergency (excluding a fire) has been dealt with sufficiently to permit return to normal operations will be made by the ER Chief using the same criteria as in determining the start of the emergency. If the emergency is a fire then the decision is made by the Fire Department. The area likely will be cordoned off and an investigation initiated by them.

7.9.3 Let Burn Policy

Federal storage facilities should consider adopting a let burn policy. This will authorize the Fire Chief at the scene to make a judgment decision to let the facility burn if it is determined that by continuing to apply water, extensive contamination will result from water run-off or there will be a release of toxic compounds into the air due to incomplete combustion of chemicals. This policy should be first discussed with Environment Canada, the insurers of the facility, and a signed approval document sent to the Fire Chief.

7.10 Spills

7.10.1 General Clean-Up Procedures

The development of a spill contingency plan is a way of preparing for such incidents and reducing the extent of health hazards and environmental contamination. For advice contact Environment Canada emergencies at 1-800-565-1633. When a spill occurs, it should be cleaned up as quickly and safely as possible.

7.11 Emergency Response Plan for Vehicle Accidents Involving Pesticides

The following steps should be taken when a vehicle accident occurs involving pesticides:

- immediately report the accident by calling 911, describing the location, any injuries, and that pesticide product is leaking from the vehicle;
- attend to any injuries;
- follow steps for pesticide spills as outlined in Part I;
- notify first responders on their arrival as to the nature of the products spilled;
- the vehicle must be thoroughly cleaned and decontaminated before any further use;
- contact emergencies line 1-800-565-1633; and
- contact a commercial hazardous waste disposal company (see Appendix 10) for proper disposal of any contaminated material.

7.12 Emergency Response Plan for Employee Accident

If the rescue of a fallen employee is required, assess the situation (ER Chief). If the rescue cannot be made safely by ER Team members, keep the employee warm and provide encouragement until the ambulance/fire crews arrive.

7.13 Emergency Response Plan for a Civil Emergency

Any group of emergency events that may affect the site, although their origin is not within your operation may initiate the Emergency Response system. These include, but are not intended to be limited to, the following:

- natural disasters such as flood, tornado, or lightning;
- external accidents from truck crash or train derailment; and
- civil emergencies such as theft of product, a municipal power failure, or requirements for evacuation as a result of an off-site event.

The ER Chief will be in charge during a civil emergency and will assess the need for action at the time against the capabilities of the ER Team.

7.14 Material Safety Data Sheet (MSDS)

Understanding and considering the information on an MSDS helps applicators and handlers of pesticides make effective and environmentally sound decisions regarding emergency response and safe handling practices. It is also important that the local fire department and emergency responders have access to copies of MSDSs for each product carried by a vendor.

More details on Material Safety Data Sheets may be obtained from:

- the pesticide manufacturers or product supplier;
- Canadian Centre for Occupational Health and Safety at 1-800-263-8466 or http://www.ccohs.ca.

- North American Compendiums Ltd., P.O. Box 39, Hensall, Ontario, N0M 1X0. Phone: 1-800-350-0627 or fax (519) 263-2936); and
- Agrichemical Warehouse Standards Association or a member of the Crop Protection Institute at: http://www.awsacanada.com/.

PART III
APPENDICES

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1.0 EXAMPLE RISK ASSESSMENT TABLE*

UNWANTED EVENT	EXAMPLE OF POSSIBLE CAUSES	IMMEDIATE CONSEQUENCES	CONTROL MECHANISM TO ELIMINATE OR REDUCE RISK	ACTIONS FOR CONTROL
1. Fire	1. Faulty electrical 2. Smoking in facility	Fire and loss of facility. Evacuation of surrounding area.	Regular inspection of electrical systems. Follow operating procedures.	Include electrical systems on monthly check list. Repair any damaged electrical system immediately.
2. Spill	1. Forklift damage 2. Punctured or leaking containers 3. Vehicle transporting product	Loss of product, contamination of the site, or employee exposure.	Provide adequate lighting, training for forklift operator, impermeable floor, eye wash station, and personal protective equipment.	Have a plan for spill clean-up and containment. Monthly inspection of spill kit, eye wash station, personal protective equipment.
3. Major or Minor Injury	1. Forklift accident 2. Vehicle accident 3. Fall or slip	Employee injury or fatality. Loss of work.	Training, adequate lighting, maintenance check of forklift. Keep area and floor clean.	Initiate a training program. Monthly inspection of forklift, floors, and first aid kit.
4. Civil Emergency	Break in			
5. Others				
6. Others				
7. Others				

* For reference only.

2.0 CORRECT STORAGE PATTERNS FOR DANGEROUS GOODS

CORRECT STORAGE PATTERNS FOR DANGEROUS GOODS

C2 to C7

2002Audit Protocol C2

Storage heights of flammable and combustible liquids meet N.F.C. standards.
The intent of this protocol is to store all liquids with a flash point below 93.3°C at heights consistent with the N.F.C. classes of product.
The N.F.C. classes of products and their storage heights are as follows:

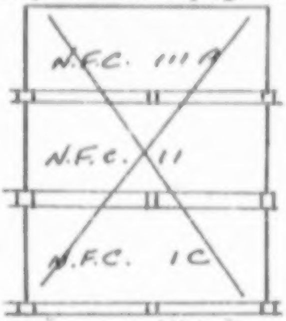
	Storage Heights (m)		
	Unsprinklered Building	**Sprinklered Building**	**In rack Sprinklered Building**
Class IA – flash point below 22.8°C and boiling point below 37.8°C	1.5	1.5	7.5
Class IB – flash point below 22.8°C and boiling point at or above 37.8°C	1.5	2.0	7.5
Class IC – flash point at or above 22.8°C and below 37.8°C	1.5	2.0	7.5
Class II – flash point at or above 37.8°C and below 60.0°C	3.0	3.0	7.5
Class IIIA – flash point at or above 60.0°C And below 93.3°C	4.5	6.0	12.0

Class IA, IB and IC are flammable liquids under the N.F.C. and Class II and IIIA are combustible liquids under the N.F.C.
For an unsprinklered warehouse, this translates into the following National Fire Code classes:

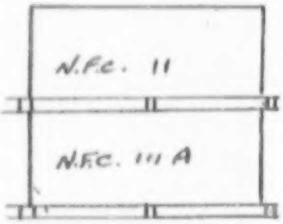
Class IA, IB and IC	- one pallet high (approx. 5 ft.)
Class II	- two pallets high (approx. 10 ft.)
Class IIIA	- three pallets high (approx. 15 ft.)

The N.F.P.A. (National Fire Prevention Association), which develops codes for users in the United States and from which the N.F.C. is modeled, does not allow storage of class II product on top of IB or IC products or the storage of class IIIA on top of IB, IC, or II class of products. It is therefore the N.F.C. and Protocol C2 intent though to follow the N.F.P.A. code in this regard.

Exhibit "A" below represents an unacceptable method of stacking.
Exhibit "B" below represents an acceptable method of stacking.
The complete pile in exhibit "B" would be considered N.F.C. Class II for quantity calculations.
In larger warehouse facilities where other non agricultural dangerous goods are stored within the same fire compartment as agrichemicals, these products must also be in compliance as it impinges on the integrity of the certified area.



Exibit "A"



Exibit "B"

3.0 EXAMPLE STORAGE FACILITY EMPLOYEE TRAINING RECORDS

Name of Employee	General Rules	Operating Procedures	TGD	Forklift	OH&S	CPR	First Aid	Fire Extinguisher
Smith, Gary	*Nov 99*	*Nov 99*	*May 00*		*Nov 99*	*Oct 01*	*Oct 01*	*Feb 00*
Training Frequency	At Time of Employment		Every 3 Years	Every 3 Years	At Time of Employment	Annual	Every 2 Years	Once Only

Note:

List should include the names of full time, part time, and temporary employees involved in receiving, handling, storage or shipping of Pest Control Products at Federal facilities.

4.0 MONTHLY PESTICIDE STORAGE FACILITY CHECK LIST

Pesticide Storage Facility Check List

Starting Date______________________ **Manager:**__________________________

	DATE											
INSPECTION ITEM	1	2	3	4	5	6	7	8	9	10	11	12
Fire extinguishers (forklift & Wall mount)												
Wheel chocks												
Lighting for forklift												
Leveler plate												
Clear aisles & clean floors												
Vents not blocked												
Separation of flammable & combustible products												
All product on pallets												
No food, feed, or household items in facility												
Personal protective equipment												
Eyewash station												
First aid kit												
Spill kit												
Exit doors operable												
Check exterior lighting	■	■		■	■	■		■	■	■	■	■
Test of fire detection system	■	■		■	■	■		■	■	■	■	■
Emergency equipment and exit signs	■	■		■	■	■		■	■	■	■	■
No cracks in floor	■	■		■	■	■		■	■	■	■	■
Emergency phone list posted	■	■		■	■	■		■	■	■	■	■
No smoking, eating or drinking signs	■	■		■	■	■		■	■	■	■	■

5.0 MONTHLY ELECTRICAL INSPECTION FORM

PESTICIDE STORAGE FACILITY *MONTHLY CHECKLIST*

Completed by:__________________________ **Date:**__________________________

ITEM	CHECK	COMMENTS
1. Main Service		
2. Distribution boxes, breaker panel and fuses		
3. Light On/Off switch		
4. Fan motor		
5. Heater		
6. Overhead lighting		
7. Emergency lighting		
8. Exterior lighting		
9. Smoke detector operation		
10. Other electrical		

6.0 EMERGENCY PHONE NUMBERS

COMPANY	DAY TIME NUMBER	NIGHT TIME NUMBER	24-HOUR NUMBER
Agricore	1-888-321-3771	1-888-321-3771	1-888-321-3771
Aventis CropScience Canada Co.			1-800-334-7577
BASF Canada Inc.	416-675-3611		1-800-832-4357
Bayer Inc.		519-337-1907	514-697-5555
Cargill Limited			1-800-567-7455
Co-operative Fedéree de Quebec	450-670-2231		514-917-0164
Cheminova Canada Incorporated			1-613-996-6666
Crompton Co./Cie *(formerly Uniroyal Chemical Co.)*			519-744-3060
Dow AgroSciences Canada Inc.			519-339-3711
DuPont Canada Inc.			613-348-3616
Federated Co-operatives Ltd.			306-721-5222
Interprovincial Cooperatives Ltd.	204-233-3461		1-800-424-9300
James Richardson International	204-934-5662 314-694-4000	1-888-494-8888 314-694-4000	1-888-494-8888 314-694-4000
Monsanto Canada Inc. (Ag. Group)			1-800-332-3111
Monsanto Canada Inc.			1-613-996-6666 1-800-668-4877
N. M. Bartlett Inc.	905-563-8261	905-563-8261	613-996-6666
NuFarm Agriculture Inc.	403-353-8471	1-202-483-7616	1-202-483-7616
Pioneer Hi-Bred Ltd.			1-800-342-7123
Plant Products Co. Ltd.	905-793-7000		613-996-6666
Rohm and Haas Canada Inc.			1-888-862-7770
Saskatchewan Wheat Pool			306-244-4494
Simico Inc.	450-799-3225		1-800-361-9859
Syngenta Crop Protection Canada Inc.			1-800-267-6351
Syngenta Seeds	1-800-265-1302 or 519-838-4851		1-800-267-6351
Tomen Agro Inc.			1-800-424-9300
United Agri Products	519-268-8001	1-800-561-8273	1-800-561-8273
United Farmers of Alberta	403-258-4500		1-800-592-5585
United Grain Growers Limited	204-944-5441	204233-8402	204-781-5450
Van Waters & Rogers Ltd.	204-489-0102		1-800-424-9300

Numbers verified May 22 2001

UPDATE BY CONTACTING http://www.awsacanada.com/ Resources Section

7.0 FEDERAL STORAGE CONTINGENCY PLANNING

A pesticide spill or a fire may never happen. But, if it does, will you be ready? You can avoid a major disaster if you are well prepared to deal with an emergency.

A Contingency Plan is important. It will:

- protect your employees
- prevent an emergency from becoming a major disaster
- protect the community and first responders
- keep environmental damage to a minimum
- build confidence with your neighbours

There are typically eight steps to a Contingency Plan:

1. Assign emergency co-ordinators. One person must be given overall responsibility. Then assign co-ordinators for specific duties.
2. Make an emergency calling list. Make a list of local authorities that need to be called if and when an emergency happens.
3. Make a list of emergency helpers from the community. Contact neighbouring businesses to see if they could help in an emergency.
4. Map the pesticide storage area and surrounding area.
5. Keep accurate inventory records at your business but away from the pesticide storage area.
6. Have all the emergency equipment you need and keep it in working condition.
7. Outline the emergency procedures in the exact order they need to be done. The emergency procedures may address the following examples:

    1) a pesticide spill and no fire;
    2) a fire and no immediate release of a pesticide; and
    3) both a pesticide fire and spill.

8. File the plan with the responsible employees and the local Fire Department. Update it every year, or any time that you make changes to the storage area.

FEDERAL PESTICIDE STORAGE CONTINGENCY PLANNING (CONT'D)

Pesticide Storage Area

Facility Name:

Civic Address:

Telephone: Work (   ) ____________ **Cellular (   ) ____________**

Emergency Telephone Numbers

Note: The following list contains phone numbers to have on hand in the event of a pesticide emergency. Call the appropriate response units as needed.

Name	Day Number	Night Number
Manager:	____________	____________
Assistant Manager:	____________	____________
Fire Department:	24 Hour Service	911
Police Department:	24 Hour Service	911
Poison Control Center:	24 Hour Service	911
Hospital:	____________	____________
CANUTEC:	24 Hour Service	613-996-6666
Regional Emergency Center:	24 Hour Service	1-800-565-1633
Provincial Pesticide Department:	____________	____________

CANUTEC provides 24 hour information and communications assistance in case of emergencies involving dangerous goods.

COPY OF SITE PLAN SENT TO LOCAL FIRE DEPARTMENT ____________________
(DATE)

FEDERAL PESTICIDE STORAGE CONTINGENCY PLANNING (CONT'D)

REPORTING

The Regional Emergency Center at ______________________ or The Director of Pesticides Control at ______________________ should be informed of all pesticide accidents and /or occurrences involving any of the following: (check with individual Provincial for specifics)

- more than 200L of concentrated pesticide released;
- more than 200L diluted pesticide released;
- any amount of pesticide accidentally released into the natural environment less than 25m from a well or body of water;
- a fire.

When calling emergency response people, be sure to give them the following information:

- name and call-back number of person reporting;
- location of the incident (civic address);
- general description of what has occurred;
- exact name, quantity and hazard class of the pesticides involved, if known;
- extent of any injuries;
- potential danger to the environment and neighbouring population.

OTHER NOTIFICATIONS: (Names and telephone numbers of agencies that may need to be notified should a spill or fire involving pesticides occur. Examples: chemical manufacture, clean-up contractor, neighbours)

Name	Telephone Number

Signature : ______________________ Date : ____________

FEDERAL PESTICIDE STORAGE CONTINGENCY PLANNING (CONT'D)
DETAILED PLAN

1. **Show outline of buildings**
2. **Locate all fixed outside equipment**
3. **Draw to scale**
4. **Show access routes**
5. **Identify the pesticide storage area(s)**
6. **Show north arrow indicator**

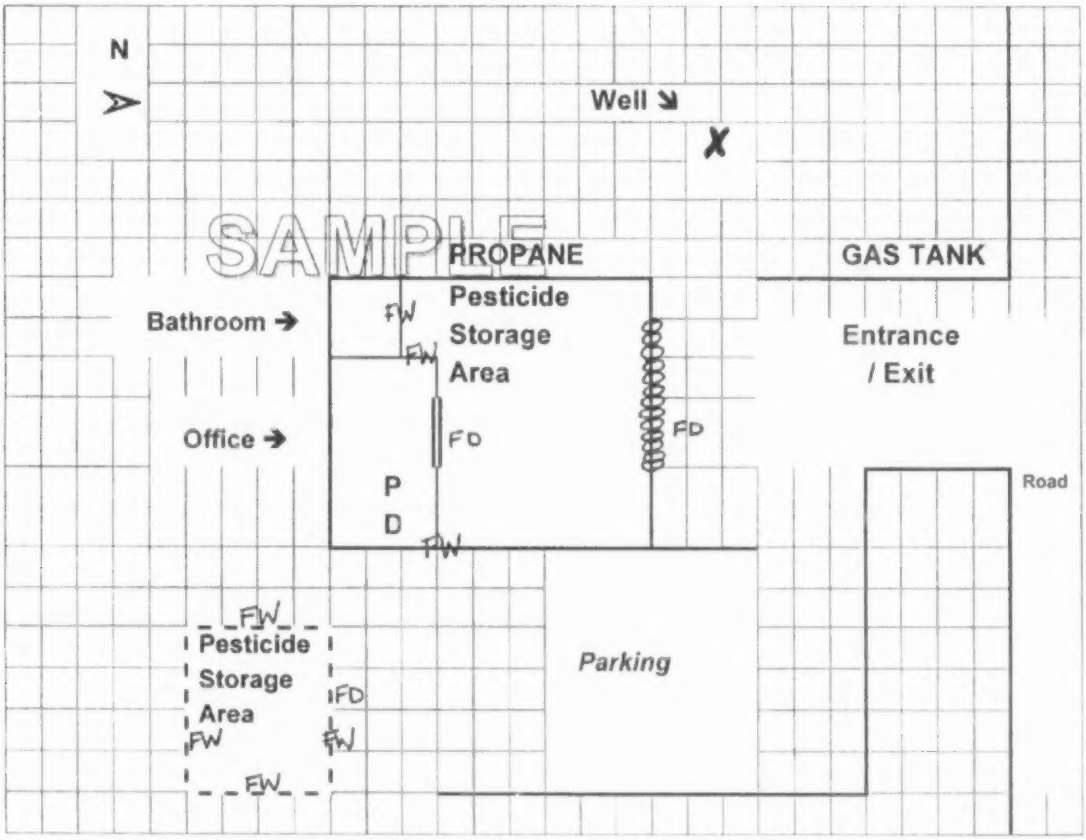
HAZARDOUS EQUIPMENT		FIRE PROTECTION EQUIPMENT		BUILDING	
Propane Tanks	(P)	Fire Hydrant	(H)	Pedestrian Door	(PD)
Gas Tanks	(G)	Sprinkler Booster Connection	(B)	Fire Door	(FD)
Fork Lift Station	(FL)	Main Gas Shutoff	(G)	Overhead Door	(OD)
		Main Electrical Shutoff	(E)	Fire Wall	(FW)

DATED:______________________ SIGNED:______________________________

FEDERAL PESTICIDE STORAGE CONTINGENCY PLANNING (CONT'D)

DETAILED PLAN

1. **Show outline of buildings**
2. **Locate all fixed outside equipment**
3. **Draw to scale**
4. **Show access routes**
5. **Identify the pesticide storage area(s)**
6. **Show north arrow indicator**


N
Well
SAMPLE
PROPANE
GAS TANK
Bathroom
Pesticide Storage Area
FW
FW
Office
FD
FD
Entrance / Exit
P
D
FW
Road
FW
Pesticide Storage Area
FD
FW
FW
FW
Parking

Scale : 2 Meters

HAZARDOUS EQUIPMENT		FIRE PROTECTION EQUIPMENT		BUILDING	
Propane Tanks	(P)	Fire Hydrant	(H)	Pedestrian Door	(PD)
Gas Tanks	(G)	Sprinkler Booster Connection	(B)	Fire Door	(FD)
Fork Lift Station	(FL)	Main Gas Shutoff	(G)	Overhead Door	(OD)
		Main Electrical Shutoff	(E)	Fire Wall	(FW)

DATED:_______________

SIGNED:_______________

8.0 SPILL CLEAN-UP EQUIPMENT LIST

The following protective clothing and spill clean-up equipment should be kept so it is readily available in case of a spill in the storage facilities or on a vehicle transporting pesticides.

PROTECTIVE CLOTHING

- unlined chemical resistant gloves
- unlined chemical resistant boots
- splash apron of rubber or neoprene
- coveralls or Tyvek suit
- protective glasses or goggles
- hard hat
- respirator with new chemical filters

SPILL CLEANUP EQUIPMENT

- aluminum shovel (non sparking)
- aluminum dust pan
- industrial grade broom
- 205 L open head drum with tight fitting lid
- 20 L open head pail with tight fitting lid
- material to label drum or pail
- absorbent material
    - industrial absorbent
    - vermiculite
    - "kitty litter"
    - peat moss

9.0 MATERIALS FOR DECONTAMINATING SURFACES EXPOSED TO PESTICIDES

Different materials can be used for decontamination depending on the pesticides. Decontamination materials and procedures are listed below for selected classes of pesticides. Before beginning the decontamination process, check the label or contact the pesticide manufacturer for specific directions regarding the best procedure to be followed.

1. Organochlorine Pesticides

Chemicals frequently recommended are household ammonia, washing soda, or activated charcoal. Some equipment may be subject to corrosion if exposed to strong acid or alkali. Rinse thoroughly as soon as possible with water.

2. Organophosphorus Pesticides

A solution of washing soda and Javex will remove these residues. Care must be taken in using strong solutions and they should be followed by at least two washings with clean water.

3. Carbamate Pesticides

Use a solution of washing soda or a strong soap solution followed by clean water.

4. Chlorophenoxy Pesticides

Complete decontamination of these compounds (*e.g.*, 2,4-D) is generally considered impossible. Some decontamination can be achieved for:

- Oil or Water Soluble Solutions:
  - a) Add 30ml of activated charcoal and 30ml of detergent to each 10L of water, shake well and use; or
  - b) Add 300ml of lye to each 10L of water and allow to stand for at least two hours before rinsing with water.
- Water Soluble Solutions:
  - a) Add 45ml of washing soda to each 10L of water and allow stand for at least two hours before rinsing with water; or
  - b) Add 125ml of household ammonia to each 10L of water and allow to stand for at least two hours before rinsing with water.
- Oil-Soluble Formulations:
  - a) Add 400ml of kerosene, 45ml of washing soda and a little detergent to each 10L of water and allow to stand for at least 2 hours before rinsing with water.

10.0 COMMERCIAL HAZARDOUS WASTES SERVICES

COMPANY NAME and ADDRESS	CONTACT PERSON	COMMENTS
Atlantic Industrial Services Inc. (Formerly Philip Services) PO Box 322 Moncton, NB E1C 8L4	Shawn Wheeler Tel: (506) 862-2750 Fax: (506) 862-2760	Transfer Station (Westmorland-Albert Solid Waste, Berry Mills, NB) for all wastes except explosives, radioactives, biomedicals, organic peroxides, & PCB's. Packaging, removal, and transportation of PCB material.
Buckham Transport Ltd. PO Box 601 Peterborough, ON K9J 6Z8	Archie P. Hoevenaars Tel: 1-800-461-7670 (705) 939-6311 Fax: (705) 939-6763	Transportation. Transfer station of all wastes except explosives, radioactives, PCB's, and biomedical.
Chem Tech Environnement Inc. 225 Industrial PO Box 929 Côteau du Lac, Quebec J0P 1B0	Richard M. Robert Tel: 1-800-567-8027 (514) 763-0066 Fax: (514) 763-0872	Transportation of all wastes except explosives, radioactives, PCB's, and biomedical.
Contech Inc. 8, 45^{e} Avenue Suite 6 Lachine, Québec H8T 2L7	Réjean Desjardins Tel: (514) 637-3111 Fax: (514) 637-3222	Transportation of PCB waste. Offer 'turn key' services in the disposal of all forms of PCB wastes (PCB liquids, ballasts, capacitors, transformers, contaminated soil, etc.). Recycling of fluorescent light tubes.
Eastern Environmental Services Ltd. PO Box 1367 Sussex Industrial Park Sussex, NB E0E 1P0	Bonnie Lawson Tel: (506) 432-9500 Fax: (506) 432-9595	Transportation of/and recycling of waste varsol (parts washer service) and waste paint thinner (industrial paint shop service), acetone, and used oil. (*) Brokerage service for other hazardous wastes. (*) Waste varsol, waste thinner, and waste acetone must contain at least 50% recoverable solvent.

COMPANY NAME and ADDRESS	CONTACT PERSON	COMMENTS
Elmtree Environmental Ltd. PO Box 444, Station 'A' Fredericton, NB E3B 4Z9	Dave Rautio Tel: (506) 470-2229 Fax: (506) 450-4995	Transfer station for industrial and household hazardous waste lab packs (Fredericton). Transportation services for hazardous wastes. Hazardous waste management (bulk and drum).
Industrial Environmental Services Inc. 660 McElmon Road PO Box 185 Debert, NS B0M 1G0	Stephen Handrahan / Darrin Black Tel: (902) 662-3358 1-800-565-4383 Fax: (902) 662-3337	Transportation services for all materials except explosives, radioactives, PCB's and biomedical waste. Transfer Station for used oil (Saint John, NB & Charlo, NB). Treatment Centre for used oil, waste water, and glycol (Debert, NS).
Material Resource Recovery (MRR) PO Box 683 Cornwall, Ontario K6H 5T5	Pierre Coté Tel: (613) 938-7575 1-800-224-6812 Fax: (613) 938-0660 e-mail: pierre@mrri.com web site: http://www.mrri.com	Processing (metal recovery) and Transfer Station for PCB light ballasts and also other PCB waste in sealed containers.
Matrix Environmental Inc. 10 Isley Avenue, Suite 3 Dartmouth, NS B3B 1L3	Scott Lewis Tel: (902) 468-2771 Cell: (902) 478-7292 Fax: (902) 468-2003	PCB Management Services / Environmental Consulting Services (Assessment and Waste Management Services) / Site Remediation Services / Decontamination Services (Lead Abatement & Air Duct) / Industrial Wastewater Treatment Services / Hazardous Waste Management services (Labpack and Bulk Waste Management) / Industrial Services / Demolition Services / Oil Field Services.
PCB Disposål Inc. 72 Lake Driveway West Ajax, Ontario L1S 3X1	Dr. Eric A. H. Smith / Dawn Barnes Tel: (905) 428-6480 1-800-563-7227 Fax: (905) 428-6481	PCB Services Available: PCB Transfer Station / Ballasts, Capacitors & Cables / Transformer Disposal / Transportation / Askarel Transformer Replacement / Soil Excavation & Disposal / Transformer Reclassification / Sampling & Analysis / PCB

COMPANY NAME and ADDRESS	CONTACT PERSON	COMMENTS
	e-mail: eahsmith@idirect.com web site: http://www.pcbdisposalinc.com/	Storage Containers / Site Remediation / Water Decontamination / Storage Tanks / Oil Transformer Reclassification / Environmental Consulting Services.
Phase Industrial Services Inc. 101 Isley Avenue, Unit #6 Dartmouth, NS B3B 1S8	Mike MacMillan Tel: (902) 468-3438 Cell: (902) 471-9966 Pager: (902) 498-2875 Fax: (902) 468-4623 Jim Bellefontaine Tel: (902) 468-3438 (#107)	Chemical Cleaning and Site Remediation / Emergency Oil - Chemical Spill Response / Waste Oil - Water Transportation and Disposal / Packaging, Removal, Transportation and Treatment of All Types of Hazardous Material, Including PCB Waste / Storage Tank Management / Pipeline Rehabilitation and Trenchless Technologies: Polly Pigging, Slip Lining, Insituform, Pipe Bursting, Cleaning / Hydro Blasting - Drain Cleaning / Laboratory Analysis and Waste Characterization / Fluorescent Tube Lightning Crushing - Transportation & Disposal.
Philip Services Inc. (Head Office) 45 Wright Avenue Dartmouth, NS B3B 1G9	Paul Sanford Tel: (902) 468-3331 Fax: (902) 468-4664	Hazardous waste management and disposal / Emergency spill response / PCB management / Site remediation / Explosive handling / Wastewater treatment and disposal / Analytical services. Chemical cleaning / Tank cleaning / Sludge dewatering / Demolition and decommissioning / Fuel tank removal, repair and replacement.
Preferred Environment Inc (The Paint Recycling Company) 70 Waterloo St. Moncton, NB E1C 1A8	Pierre Landry / Jason Loiselle Tel: (506) 384-2000 1-877-384-2007	Established in 1994 The company offers two basic services. The first is a cost effective mean of managing waste paint, while the second is to sell at retail and wholesale recycled paint under the trademark Nature's Colors.
Proeco Corporation 7722 - 9th Street Edmonton, Alberta T6P 1L6	Gerry Gerke Tel: (780) 440-1825 Fax: (780) 440-2428	Full PCB Waste Management Services; Disposal / Recycling services for Transformers, Cable, Ballasts, Capacitors, Soils, Debris, Solvents, Paints Low Level Oil, Askarel, Site Remediation and decontamination, Transportation.
Quantex Technologies Inc.	Sid Hales	Laboratory analysis and waste

COMPANY NAME and ADDRESS	CONTACT PERSON	COMMENTS
25 Akerley Blvd. Dartmouth, NS B3B 1J7	Tel: (902) 468-8848 Fax: (902) 468-8767	characterization. Transportation of all wastes except explosives, radioactives, PCB's, biomedical. Environmental site audits.
Republic Environmental System (Brockville) Ltd. PO Box 845, (R.R.#5) Brockville, Ontario K6V 5W1	Laurie Levere Tel: (613) 342-3703 Fax: (613) 342-1621	Transportation of all wastes except explosives, radioactives, PCB's, and biomedical. Transfer Station for all wastes except explosives, radioactives, PCB's, and biomedical.
Safety-Kleen (Atlantic) Ltd. 640 McElmon Road Debert, NS B0M 1G0	Josee Roy Tel: (902) 662-2239 1-800-565-7474 Fax: (902) 468-2941	Waste Management Company. Transfer Station (Debert, NS) accepts all wastes except, explosives, PCB's, radioactives and biohazards. Provides the services of packaging, transportation and disposal of PCB's, radioactives and explosives. Provide tank cleaning and vacuum truck service.
Sanexen Environmental Services 579 rue Le Breton Longueuil, Quebec J4G 1R9	Jacques Dion / Robert Dumais Tel: (450) 646-7878 Fax: (450) 646-5127	Turnkey services (handling, transportation, treatment and/or disposal) for all forms of PCB waste. Site remediation services. Mobile water treatment units.
Sani Mobile B.S.L.G. Inc. 88 rue, Durette Case Postale 398 Matane, Québec G4W 3N3	Clément Roy Tel: (418) 562-6085 Fax: (418) 562-3981	Transportation of all wastes except explosives, radioactives, and gases. Transfer Station for all wastes except explosives, radioactives, gases, and PCB's.
Services Chem-Met (Québec) Inc. Chem-Met Services (Quebec) Inc. 12734, boul. Industriel Blvd. Montréal (Québec) Canada H1A 3V2	Romain Gean Tel: (514) 644-1412 Fax: (514) 644-1447	Broker only (will identify appropriate disposal services for a fee).

COMPANY NAME and ADDRESS	CONTACT PERSON	COMMENTS
Services Sanitaires Blainville Inc. 750 boul. Industriel Blainville, Québec	André Provencher Tel: (514) 430-1496 Fax: (514) 430-3741	Transportation including transportation of PCB's.
Service Sanitaires de Recyclage Expert Inc. (Recyclex) 8745 Place Crescent 1 Ville d'Anjou, Quebec H1J 1C9	Keith Coffin Tel: (514) 355-4150 Fax: (514) 355-4148	Transportation of waste organic chemicals, waste paints, waste from petroleum refining, waste solvents, and used oil.
Siemens Westinghouse 80 Entreprise Street Moncton, NB E1E 3P7	Glen Pinsent Tel: (506) 857-8457 Fax: (506) 858-9483	Transportation of PCB's.
Stablex Canada Inc. 760 boul. Industriel Blainville, Quebec J7C 3V4	Richard Dufresne Tel.: (514) 430-9230 Fax: (514) 430-4642	Treatment and disposal of inorganic hazardous wastes.
Systech Environmental Inc PO Box 218 3 Lafarge Road St. Constant, Quebec J5A 2G3	Bruno Pelletier Tel: (514) 635-1275 Fax: (514) 635-1277	Transfer Station for liquid wastes, chlorinated and non-chlorinated solvents, petroleum products, alcohols, caustic solutions (no PCB's).
Trans Cycle Industries Inc. (TCI) 455 Archer Drive Kirkland Lake, ON Z1Z 1Z1	Paul Hebert / Bev Earley Tel: (450) 458-1903 Fax: (450) 458-2760	PCB Waste Disposal Site (Processing / Transfer).
MSWM Ltd PO Box 927 Moncton, NB E1C 8N8	J-G Richard Tel: (506) 855-4404 Fax: (506) 858-0877	Transportation and Destruction of: 1) Biomedical Waste; 2) Pharmaceutical; 3) Confidential Documents.

(*) This is not an endorsement for any company listed.
This list is for general information purposes only.

Note: It is always prudent to discuss environmental liability insurance coverage with any hazardous waste disposal company before making a final decision.

11.0 CERTIFICATION AND LICENSING REQUIREMENTS IN ATLANTIC CANADA

Province	Mandatory Certification of Vendors *(qualified individual)*	Private Applicator Certification Program *(qualified individual)*	Commercial Applicator Certification Programs *(qualified individual)*	Provincial Contact Person	Phone Fax Email
NB	Restricted and Commercial	Restricted and Commercial	11 categories/ annual re-certification	Greg Shanks NB Department of Environment and Local Government PO Box 6000 Fredericton, NB E3B 5H1	506-453-2098 506-453-2390 kathy.stapleton@gnb.ca
NS	Restricted and Commercial	Restricted and Commercial	11 categories 5 year re-certification	Lynda Rankin Department of Environment and Labour PO Box 697 Halifax, NS B3J 2T8	902-424-2578 902-424-0503 rankinlx@gov.ns.ca
PEI	Restricted and Commercial	Restricted and Commercial	9 categories	Don Reeves PEI Agriculture and Forestry PO Box 306 Kensington, PE C0B 1M0	902-836-8924 902-836-8921 dbreeves@gov.pe.ca
NL	Restricted and Commercial	Restricted and Commercial	10 categories 5 year re-certification	Karen Ryan NL Department of Environment PO Box 8700 St. John's, NL A1B 4J6	709-729-3395 709-729-6969 kryan@mail.gov.nf.ca

12.0 APPLICATION EQUIPMENT CALIBRATION

Introduction

It is important to select the right pesticide and apply it at the right time for effective pest control. It is equally important to apply the right amount of pesticide to control a specific pest. The amount of pesticide applied per unit area or per plant is known as the application rate. A pesticide product label provides the application rate for a specific pest. The label is a legal document. Thus pesticide products can only be used to control pests listed on the label and also can only be applied at specified rates. If higher application rates are used, there may be crop damage, harmful residues, excess runoff or damage to non-target plants or animals. If lower rates are used, the treatment may not be effective.

Preparation for pesticide treatment to ensure that application equipment will deliver the amount of pesticide specified on a product label involves calibration of the application equipment so that it will cover an area uniformly, with the correct output and calculation (See Appendix 15 for details) of the amount of pesticide and carrier to add to the tank or hopper and the amount of pesticide required to treat the entire area.

Calibration of application equipment may require adjustment of nozzles, operating pressures, or ground speeds. After adjustment, equipment should be checked to measure its rate of delivery. Final adjustments may then be required to correct the delivery rate.

When equipment has been accurately calibrated to deliver the required output, relatively simple calculations are required to determine the amount of pesticide product to add to a spray tank or to apply to a specific treatment area. Several types of calculations may be required because application rates on pesticide labels are described in several ways.

When to Calibrate

Calibration should be done when new equipment is to be used, when the pesticide product or dilution is changed, when the nozzles, hoses, or pump pressure are changed, and at regular intervals to determine whether wear has changed pesticide output. Sprayers with brass nozzles should be recalibrated after about 25 hours of use. Sprayers with stainless steel nozzles should be recalibrated after about 50 hours of use. Calibration should be done more frequently when abrasive wettable powders are used as they will wear on the nozzles, increasing the size of the opening.

Equipment Adjustment and Calibration

The first step in preparing for pesticide application is to select a pesticide and to determine the required delivery rate of the application equipment. When using granular pesticides, the delivery rate is the amount of granules discharged per unit area. The delivery rate must be adjusted to give the application rate specified on the product label (e.g. 45 kg/ha). When pesticides are applied as a spray, the equipment delivery rate is the spray volume applied per unit area. The operator must select the spray volume that is appropriate for the proposed treatment. Some label directions indicate a specific spray volume, e.g. "apply 5 L pesticide in 600 L of water per hectare". Other label directions do not indicate a specific spray volume, e.g. "apply 5 L pesticide in up to 500 L of water per hectare" or "in 200 to 600 L of water per hectare".

When the spray volume is not specified, the operator must consider such factors as the following:

- the coverage required (spraying to runoff requires a greater spray volume than spraying only to wet surfaces);
- the surface to be treated (dense foliage or porous surfaces may require a greater spray volume);
- droplet sizes (a high spray volume generally means course sprays can be used); and
- mixing requirements (a high spray volume may require large spray tanks or frequent stopping to mix spray solutions).

Delivery Rate

Equipment output is the amount of pesticide discharged per unit time (e.g. kg/min or L/min). For granular spreaders, operator instructions generally indicate what output setting to use and what speed to drive in order to deliver a specific swath width and application rate. In liquid spray equipment, the output is dependent on the number of nozzles, the nozzle opening sizes and line pressure. The nozzle manufacturers typically provide charts that show the combination of nozzle type and pressure that will produce a desired output (L/min). However, these output values should be checked in the field during equipment calibration. Most charts of output are based on the flow characteristics of water. Where the spray mix has a different weight or viscosity (thickness) than water, the sprayer should be calibrated with water, then output should be checked using the spray mix.

Ground speed of the equipment is inversely related to its delivery rate. If you double the speed the application equipment travels over the ground, the delivery rate (kg/ha or L/ha) is halved. Motorized equipment speeds are typically between 3 and 12 km/h. If the speed is too fast, drift is increased, if speed is too slow, application time may be too long. Motorized equipment must be operated at a speed suited for the equipment. Tractor or truck speedometers are often inaccurate in the field due to wheel slippage. It may be necessary to check the forward speed under field conditions by recording the time taken to drive a measured distance. The gear and throttle setting or rpm should be recorded for use during pesticide application.

Swath width is the width over which spray droplets or granules are distributed as the equipment moves along its path. In broadcast applications, the pesticide is applied uniformly over the treatment area in overlapping passes. Swath width is measured from the center of overlap between each pass. In band applications, the pesticide is applied to a strip such as a crop row. The swath width is the width of the band(s) applied in one pass.

13.0 CALCULATIONS FOR APPLYING PRODUCT

Information Required by the Operator Before Undertaking an Application:

1. Application Area to be Treated
   If the area to be treated is a rectangle or square shape, then the size is determined by multiplying the length (in metres) by the width (in metres) giving us the total area to be treated (in square metres). By dividing this number by 10,000 this gives us the size of the area in hectares. If the area is known in acres, then multiply by 0.4 to give area in hectares.

2. Spray Tank Size
   This information can be obtained from the manufactures specifications or from measurements using known amounts of water. A metered flow measuring device may be utilized with the water pump for accuracy of mixture.

3. Application Rate
   This information is obtained from the Directions for Use Statement as noted on the secondary panel of the label (given in L/ha or G/ha).

4. Calibration of the Spray Equipment
   This information is obtained as noted in Appendix 14: Pesticide Application Equipment Calibration.

Calculations

Total amount of product to purchase = *Application Area X Application Rate* (G or L)

$$\text{Area covered per tank of solution} = \frac{\text{Spray Tank Size (L)}}{\text{Application Rate (L/ha)}} = \text{(in Hectares)}$$

Amount of pesticide added to a full tank = *Application Rate X area covered per tank* = L

$$\text{Number of tanks required to spray entire treatment area} = \frac{\text{Application Area}}{\text{Area covered per tank}}$$

Volume of solution required for the final load = *Spray Tank Size X decimal portion of the final load*

The amount of pesticide required for the final load = *Application Rate X decimal portion of the final load*

14.0 PROVINCIAL CONTACTS FOR TRANSPORTATION OF WASTE DANGEROUS GOODS

NAME	PHONE	FAX	EMAIL
Simone Godin (Chair) New Brunswick	(506) 453-3855	(506) 453-2390	simone.godin@gnb.ca
Betty Smith Ontario	(416) 314-7917	(416) 314-9411	smithbe@ene.gov.on.ca
Rob Dalrymple British Columbia	(250) 356-9973	(250) 953-3856	robert.dalrymple@gems5.gov.bc.ca
Duncan Mackay Nova Scotia	(902) 424-2559	(902) 424-0503	mackaydh@gov.ns.ca
Marie Ryan Newfoundland	(709) 729-6483	(709) 729-6969	ryanm@gov.nl.ca
Glenda MacKinnon-Peters Prince Edward Island	(902) 368-5047	(902) 368-5830	gcmackinnon-peters@gov.pe.ca
Benoit Nadeau Quebec	(418) 521-3950 *ext. 4955*	(418) 644-3386	benoit.nadeau@menv.gouv.qc.ca
Joe Wittwer Canada	(819) 953-2171	(819) 997-3068	joe.wittwer@ec.gc.ca
Don Labossiere Manitoba	(204) 945-7094	(204) 948-2420	dlabossier@gov.mb.ca
Tony Fernandes Alberta	(780) 427-0636	(780) 422-4192	antonio.fernandes@gov.ab.ca

Revised March 2004

15.0 APPLICATION RECORDS

Items	Notations
Date and time of application	
Location of application (Site number)	
Pest treated (pest identified by, stage, numbers, etc.)	
Target site (entire area, spot treatment, etc.)	
Pesticide Used (Product name and *PCP Act* No.)	
Application Rate	
Applicator's name and license/certificate #	
Type of application equipment	
Equipment settings (*e.g.*, nozzles used, pressure, spacing, speed, boom height, etc.)	
Weather conditions (Last rain, wind speed, temperatures, relative humidity)	
Adjacent areas (*e.g.*, crops)	
Other Notes	

Post Application Records

Item	Notations
Evaluation of the application (degree of control, areas where minimal control, etc.)	
Any environmental effects resulting from pesticide use	
End of Season Product Inventory Records Trade Name PCP No. Amount Trade Name PCP No. Amount	

Dated ________________________ Supervisor's Signature ____________________________

16.0 REVISED SPECIAL CASE TDG REGULATIONS

PART 1: COMING INTO FORCE, REPEAL, INTERPRETATION, GENERAL PROVISIONS AND SPECIAL CASES

http://www.tc.gc.ca/tdg/clear/tofc.htm

1.1 Coming into Force

These regulations came into force on August 15, 2002.

Special Cases

The following sections, and some of the special provisions included in Schedule 2, Special Provisions, provide an exemption for dangerous goods that are "in transport". Such an exemption extends to handling, offering for transport and to the means of containment used. In section 1.15, for example, a shipping document is not required when the dangerous goods are in transport. Consequently, the consignor would not be required to prepare a shipping document before the dangerous goods are placed in transport.

1.15 Exemption for Personal Use

(1) These Regulations do not apply to dangerous goods in transport on a road vehicle, a railway vehicle or a ship on a domestic voyage, if the dangerous goods:

(a) are transported between:

- (i) a retail outlet and the residence of the purchaser,
- (ii) a retail outlet and the purchaser's place of use,
- (iii) the residence of the purchaser and a place of use, or
- (iv) two residences;

(b) are contained in one or more means of containment each of which has a gross mass less than or equal to 30 kg and is designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no accidental release of dangerous goods that could endanger public safety;

(c) are not for resale or for commercial or industrial use; and

(d) are in a quantity and concentration available to the general public at retail outlets.

Examples of retail outlets are hardware stores, automotive industry stores, pool supply stores and farm co-ops.

1.16 500 kg Exemption

(1) These Regulations do not apply to dangerous goods in a quantity less than or equal to 500 kg gross mass in transport solely on land on a road vehicle or railway vehicle if:

(a) the dangerous goods are contained in one or more means of containment, each of which has a gross mass less than or equal to 30 kg;

(b) the dangerous goods are accompanied by a shipping document that, despite sections 3.5 and 3.6 of Part 3, Documentation, includes the following information in the following order:

(i) the primary class of the dangerous goods in each means of containment following the word "Class" or "Classe",
(ii) the subsidiary class or classes, in parentheses, and
(iii) the number of means of containment related to each primary class, following the words "number of means of containment" or "nombre de contenants", and

For example,

Class 3(8), number of means of containment, 10
Class 8, number of means of containment, 12

(c) each means of containment, as prepared for transport, has displayed on one side, other than the side on which it is intended to rest or to be stacked during transport,

  (i) the dangerous goods safety marks required by Part 4, Dangerous Goods Safety Marks, or
  (ii) the shipping name of the dangerous goods and the marks required by one of the following Acts and regulations, as long as these marks are visible during handling and transporting:
    (A) the "Explosives Act" and its regulations,
    (B) the "Pest Control Products Act" and its regulations,
    (C) the "Hazardous Products Act" and its regulations, or
    (D) the "Packaging and Transporting of Nuclear Substances Regulations"; and

(d) the person transporting the dangerous goods is trained in accordance with Part 6, Training.

1.17 Limited Quantities

Subsection (1) establishes the concept of a limited quantity of dangerous goods. Note that it is established in terms of a consignment, that is, a consignment of dangerous goods is a limited quantity if the conditions in this section are met.

Subsection (2) provides an exemption for a limited quantity.

Subsection (3) provides an exemption for an accumulation of more than one limited quantity. However, there are conditions. For example, the means of containment containing the dangerous goods must be marked. Also, when an accumulation of dangerous goods exceeds 500 kg gross mass and is offered for transport by one consignor to one destination, the dangerous goods must be accompanied by a document.

(1) A consignment of dangerous goods, other than explosives, is a limited quantity if:

  (a) the consignment is contained in a means of containment that has a gross mass less than or equal to 30 kg and is designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no accidental release of the dangerous goods that could endanger public safety; and
  (b) the dangerous goods

    (i) if a solid, have a mass that is less than or equal to the number shown for them in column 6 of Schedule 1 when that number is expressed in kilograms,
    (ii) if a liquid, have a volume that is less than or equal to the number shown for them in column 6 of Schedule 1 when that number is expressed in litres, or

(iii) if a gas, including a gas in a liquefied form, are contained in a means of containment that has a water capacity less than or equal to the number shown for them in column 6 of Schedule 1 when that number is expressed in litres.

(2) These Regulations do not apply to a limited quantity of dangerous goods in transport on a road vehicle, a railway vehicle or a ship on a domestic voyage, if the means of containment is marked on one side, other than the side on which it is intended to rest or to be stacked during transport, with the words "Limited Quantity" or "quantité limitée" or the abbreviation "Ltd. Qty." or "quant. tée" with each letter at least 25 mm high and in a colour that contrasts with the background colour of the means of containment.

(3) These Regulations do not apply to an accumulation of limited quantities of dangerous goods in transport on a road vehicle, a railway vehicle or a ship on a domestic voyage, if the limited quantities are in one or more means of containment each of which is marked on one side, other than the side on which it is intended to rest or to be stacked during transport, with the words "Limited Quantity" or "quantité limitée" or the abbreviation "Ltd. Qty." or "quant. ltée" with each letter at least 25 mm high and in a colour that contrasts with the background colour of the means of containment.

(4) When a limited quantity is in a means of containment that is inside another means of containment that has a gross mass less than or equal to 30 kg and the outer means of containment is marked in accordance with subsections (2) and (3), the inside means of containment is considered to be marked with the words "Limited Quantity" or "quantité limitée" or the abbreviation "Ltd. Qty." or "quant. ltée".

(5) When the gross mass of an accumulation of limited quantities offered for transport by one consignor to one destination is greater than 500 kg, the consignor must give to the carrier a shipping document that, despite sections 3.5 and 3.6 of Part 3, Documentation, includes the words "Limited Quantity" or "quantité limitée" or the abbreviation "Ltd. Qty." or "quant. ltée" and a list of the classes of dangerous goods in the accumulation.

1.21 Agriculture: 1 500 kg Farm Vehicle Exemption

These Regulations do not apply to dangerous goods in a quantity less than or equal to 1 500 kg gross mass in transport on a road vehicle licensed as a farm vehicle if:

(a) the dangerous goods are transported solely on land for a distance less than or equal to 100 km;

(b) the dangerous goods are to be or have been used for agricultural purposes; and

(c) the dangerous goods do not include:

    (i) Class 1, Explosives, other than explosives included in Class 1.4S,
    (ii) Class 2.1, Flammable Gases, in a cylinder that has a water capacity greater than 46 L,
    (iii) Class 2.3, Toxic Gases,
    (iv) Class 6.2, Infectious Substances, or
    (v) Class 7, Radioactive Materials.

1.22 Agriculture: 3 000 kg Retail Exemption

These Regulations do not apply to dangerous goods in a quantity less than or equal to 3 000 kg gross mass in transport on a road vehicle if:

(a) the dangerous goods are transported solely on land between a retail outlet and the residence of the purchaser or the place of use, for a distance less than or equal to 100 km;

(b) the dangerous goods are to be or have been used for agricultural purposes;

(c) the dangerous goods are in a means of containment that is designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no accidental release of the dangerous goods that could endanger public safety; and

(d) the dangerous goods do not include:

- (i) Class 1, Explosives, other than explosives included in Class 1.4S,
- (ii) Class 2.1, Flammable Gases, in a cylinder that has a water capacity greater than 46 L,
- (iii) Class 2.3, Toxic Gases,
- (iv) Class 6.2, Infectious Substances, or
- (v) Class 7, Radioactive Materials.

1.23 Agriculture: Pesticide Exemption

(1) Part 3, Documentation, the requirements for the display of a UN number in section 4.15 of Part 4, Dangerous Goods Safety Marks, and Part 6, Training, do not apply to a solution of pesticides in transport on a road vehicle if:

(a) the dangerous goods are transported solely on land for a distance less than or equal to 100 km;
(b) the dangerous goods are in a large means of containment that:

- (i) has a water capacity less than or equal to 6 000 L, and
- (ii) is used to prepare the dangerous goods for application or to apply the dangerous goods; and

(c) only one large means of containment containing the solution of pesticides is in transport on the road vehicle.

(2) Despite the exemption for documentation in subsection (1), when an emergency response assistance plan is required under Part 7, Emergency Response Assistance Plan, the dangerous goods must be accompanied by a shipping document.

1.28 Transportation between Two Properties

These Regulations do not apply to dangerous goods, other than Class 1, Explosives, or Class 7, Radioactive Materials, that are in transport on a road vehicle between two properties owned or leased by the manufacturer or user of the dangerous goods if

(a) the dangerous goods are transported a distance less than or equal to 3 km on a public road;

(b) the road vehicle has displayed on it:

- (i) the placard for the primary class of the dangerous goods, or

(ii) the DANGER placard;

(c) the dangerous goods are in a means of containment that is designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no accidental release of the dangerous goods that could endanger public safety; and

(d) the appropriate provincial authority listed in the following table is advised of the nature of the dangerous goods in advance of the transport:

Province	Authority
Alberta	the local police and the appropriate provincial authority at 1-800-272-9600
British Columbia	the local police and the Public Emergency Program at 1-800-663-3456
Manitoba	the Department of Conservation at (204) 945-4888 and either the local police or fire department
New Brunswick	the local police or 1-800-565-1633
Newfoundland	the local police and the Canadian Coast Guard at (709) 772-2083
Northwest Territories	the appropriate authorities at (867) 920-8130
Nova Scotia	the local police or 1-800-565-1633 or (902) 426-6030
Nunavut Territory	the local police and the Nunavut Emergency Services at 1-800-693-1666
Ontario	the local police
Prince Edward Island	the local police or 1-800-565-1633
Quebec	the local police
Saskatchewan	the local police or 1-800-667-7525
Yukon Territory	the appropriate authorities at (867) 667-7244

2.7 Marine Pollutants

(1) A substance that is not a mixture or solution is a marine pollutant if:

(a) there is the letter "P" (marine pollutant) or there are the letters "PP" (severe marine pollutant) in column 10 of Schedule 1 opposite the shipping name of the substance;

(b) the substance is listed by name in column 1 of Appendix 1, Marine Pollutants, to this Part; or

(c) the substance meets the criteria for a marine pollutant in accordance with the IMDG Code.

(2) A mixture or solution is a marine pollutant if it contains

(a) 1 per cent or more of a severe marine pollutant; or

(b) 10 per cent or more of a marine pollutant as determined under paragraph (a) or under subsection (1).

(3) When a shipping name has opposite it in column 10 of Schedule 1 the symbol "•" , the consignor must determine, in accordance with subsections (1) and (2), if the substance to be transported under the shipping name is a marine pollutant or a severe marine pollutant.

A shipping name may cover several distinct substances, one of which may be a marine pollutant while others are not. In this case, the shipping name has opposite it the symbol"•". Depending upon the actual substance, the requirements related to a marine pollutant may apply.

Marine pollutants and severe marine pollutants are required to be identified on a shipping document in Part 3, Documentation, and on a means of containment in Part 4, Dangerous Goods Safety Marks.

17.0 FEDERAL GOVERNMENT HAZARDOUS SUBSTANCES DIRECTIVE

Definitions
In this directive:

Hazard information *(renseignements sur les substances hasardeuses)* - in respect of a hazardous substance, information on the proper and safe storage, handling and use of the hazardous substance including information relating to its toxicological properties;

Hazardous substance *(substance hasardeuse)* - a chemical, biological or physical agent that by reason of a property that the agent possesses is hazardous to the safety or health of a person exposed to it;

Qualified person *(personne qualifiée)* - a person who because of his knowledge, training and experience is qualified to perform a specified task;

Safety and Health committee *(comité de sécurité et de santé)* - a committee established pursuant to the Committees and Representatives Directive;

Safety and Health representative *(représentant en matière de sécurité et de santé)* - a person appointed as a safety and health representative pursuant to the Committees and Representatives Directive.

Selective Requirements

2.1 Records of Hazardous Substances

2.1.1 Every department shall, in consultation with the health and safety committee, develop a system to keep and maintain a record of all hazardous substances that, in the work place, are used, produced, handled, or stored for use in work places controlled by the department.

2.1.2 Records of all hazardous substances must be readily accessible to employees and may be retained in the work places concerned or as a centralized record that identifies work place conditions.

2.1.3 Where the department does not control the work place, these records shall be kept and maintained to the extent possible.

2.1.4 The system referred to in subsection 2.1.1 shall confirm:
(a) the requirement to use the hazardous substance;
(b) the decision to use a hazardous substance is made only after determining:

  (i) the hazardous substance cannot be eliminated;
  (ii) no other less hazardous substance can be substituted.

2.4 Storage, Handling and Use

2.4.1 Every hazardous substance stored, handled or used in a work place, shall be stored, handled or used in a manner whereby the hazard related to that substance is reduced to a minimum and any hazard resulting from that storage, handling or use shall be confined to as small an area as is practicable.

2.4.2 Every container for a hazardous substance that is used in a work place, shall be so designed and constructed that it protects the employees from any safety or health hazard that is caused by the hazardous substance.

2.4.3 The quantity of a hazardous substance for use or processing in a work place, shall, to the extent that is practicable, be limited to the quantity required for one work day.

Where, in a work place, a hazardous substance is capable of combining with another substance to form an ignitable combination and there exists a hazard of ignition of the combination by static electricity, the department shall implement the standards set out in the United States National Fire Protection Association, Inc. publication NFPA 77, Recommended Practice on Static Electricity, dated 1988, as amended from time to time.

Where in a workplace, a hazardous substance that is a biological hazard, is present, the hazard shall be controlled in accordance with Health Canada's and Medical Research Council's Laboratory Bio-safety Guidelines, 2nd Edition, 1996.

2.6 Employee Education

2.6.1 Departments shall, in consultation with the safety and health committee or the safety and health representative, if either exists, develop and implement an employee education program with respect to the prevention and control of hazards related to hazardous substances.

2.6.2 This employee education program shall include:

(a) the instruction of each employee who is likely to handle or be exposed to a hazardous substance with respect to:

- *i)* the product identifier of the hazardous substance,
- *ii)* all hazard information disclosed by the supplier or by the department on a material safety data sheet or label,
- *iii)* all related hazard information of which the department is aware or ought reasonably to be aware,
- *iv)* the observations of any related investigation conducted in accordance with paragraph 2.2.4(a)(i),
- *v)* the information disclosed on a material safety data sheet referred to in subsection 2.15.2 and the purpose and significance of that information, and

vi) in respect of controlled products in the work place, the information required to be disclosed on a material safety data sheet and on a label referred to in sections 2.16 to 2.23 and the purpose and significance of that information;

(b) the instruction and training of each employee who installs, operates, maintains or repairs an assembly of pipes or any other equipment referred to in section 2.10, with respect to

(i) every valve and other control and safety device connected to the assembly of pipes, and

(ii) the procedures to follow for the proper and safe use of the assembly of pipes;

(c) the instruction and training of each employee referred to in paragraphs (a) and (b) with respect to:

i) the procedures to follow to implement subsections 2.4.1 and 2.4.4, and
ii) the procedures to follow for the safe storage, handling, use and disposal of hazardous substances, including procedures to be followed and equipment to be used in an emergency involving a hazardous substance;

(d) where the department keeps a computerized version of a material safety data sheet available in accordance with subsection 2.21.2, the instruction and training referred to in paragraph 2.21.2(b) in accessing that material safety data sheet.

2.6.3 Departments shall, in consultation with the safety and health committee or the safety and health representative, if either exists, review the employee education program and if necessary, revise it:

(a) at least once a year;

(b) whenever there is a change in conditions in respect of the hazardous substances in the work place; and

(c) whenever new hazard information in respect of a hazardous substance in the work place becomes available to the employer.

2.6.4 The department shall keep a written or computerized record of the instruction and training given to every employee, make it readily available for examination by the employee, and keep it for a period of two years after the employee ceases,

a) to handle or be exposed to the hazardous substance, or

b) to install, operate, maintain or repair the assembly of pipes.

2.8 Control of Hazards

2.8.1 Departments shall ensure that employees are kept free from exposure to a concentration of;

(a) an airborne chemical agent, other than grain dust or airborne chrysotile asbestos, in excess of the value for that chemical agent, adopted from: The American Conference of Governmental Industrial

Hygienists in its publication entitled "Threshold Limit Values for Chemical Substances and Physical Agents", dated 1998, as amended from time to time;

(b) airborne grain dust in excess of 10 mg/m^3; or

(c) airborne chrysotile asbestos in excess of one fibre per cubic centimetre.

2.8.2 Where there is a likelihood that the concentration of an airborne chemical agent may exceed the value referred to in subsection 2.8.1, air samples shall be taken and the concentration of the chemical agent shall be determined:

(a) in accordance with the standards set out by the American Conference of Governmental Industrial Hygienists in its publication entitled "Manual of Analytical Methods Recommended for Sampling and Analysis of Atmospheric Contaminants", dated 1958, as amended from time to time;

(b) in accordance with the standards set out by the United States National Institute for Occupational Safety and Health in the "NIOSH Manual of Analytical Methods", third edition, volumes 1 and 2, dated February 1984, as amended from time to time;

(c) in accordance with a method that collects and analyses a representative sample of the chemical agent with accuracy and with detection levels at least equal to those which would be obtained if the standards referred to in paragraph (a) or (b) were used; or

(d) where no specific standards for the chemical agent are listed in paragraph (a) or (b) and no method is available under paragraph (c), in accordance with a scientifically proven method used to collect and analyze a representative sample of the chemical agent.

2.8.3 **A record of each test made pursuant to subsection 2.8.2 shall be retained for at least five years.**

2.8.4 Every record referred to in subsection 2.8.3 shall include:

(a) the date, time and location of the test;

(b) the hazardous substance in respect of which the test was made;

(c) the sampling and testing method used;

the result obtained; and

the name of the qualified person who made the test.

2.15 Identification

2.15.1 Every container of a hazardous substance, other than a controlled product, that is stored, handled, used or disposed of shall be labelled in a manner that discloses clearly the generic name of the substance, and the hazard information in respect of the substance.

2.15.2 Where a material safety data sheet in respect of a hazardous substance, other than a controlled product, that is stored, handled or used may be obtained from the supplier of the hazardous substance, the department shall obtain a copy of the material safety data sheet, and keep a copy of the material safety data sheet readily available in the work place for examination by employees.

2.29 Hazardous Waste

2.29.1 Where a controlled product in a work place is hazardous waste, the department shall disclose the generic name and hazard information in respect of the controlled product by:

(a) applying a label to the hazardous waste or its container; or

(b) posting a sign in a conspicuous place near the hazardous waste or its container.

2.32 Emergency Equipment

2.32.1 To the extent that is reasonably practicable, the following shall be provided:

(a) shower facilities to wash skin and eye-wash facilities the eyes;

  i) where it is not practicable to comply with the above, portable equipment that may be used in place of the facilities referred to above shall be provided, and
  ii) the design and installation of emergency eye-wash and shower facilities shall comply, as a minimum, with the *American National Standards Institute Standard* (ANSI) ANSI Z358.1-1981;

c) fire emergency equipment meeting the requirements of part VI of the *National Fire Code*, as amended from time to time.

18.0 RECOMMENDED AQUATIC SET BACKS

Calculated and Label Suggested Aquatic Set Backs

This document provides suggested aquatic set backs or buffer zones to be observed during agricultural applications of pesticides. Both calculated and Pest Management Regulatory Agency (PMRA) label recommended set backs have been provided. The most liberal set back has been listed where both a label and a calculated set back suggestion were available. Aquatic set backs have been derived for the appropriate application method and may range from product to product dependent upon the percent of active ingredient. The suggested set backs for each active ingredient reflect the most sensitive aquatic animal NOEC (no observed effect concentration). Where a NOEC value was not available, the LC50 (lethal concentration 50) with a 10x margin of safety factor was used. All calculated set backs were determined using toxicity to aquatic animals only, and therefore do not address the possible impact of pesticides on aquatic plants. Calculated set backs for ground and airblast applications were derived using a PMRA Excel Workbook. Calculated aerial and forestry set backs were derived using the mathematical AgDRIFT model. All label suggested set backs (marked with an asterisk (*) in the table) were extracted from the individual product labels provided through the PMRA.

For Calculated Ground and Airblast Applications:

- aquatic set backs ensure the expected environmental concentration (EEC), the direct overspray dispersed through a pond, does not exceed the NOEC of the most sensitive endpoint;

- aquatic set backs do not account for different application arrangement and meteorology, assumptions were made for upper windspeed limits;

- watercourse depths of 30cm were assumed for agricultural applications and depths of 15cm were assumed for forestry applications;

- two crops, orchard and grapes, were considered to calculated set backs for airblast application;

- set backs which were determined for early season spraying (little or no foliage) are shown bracketed, set backs determined for late season spraying (full foliage) are shown without brackets.

For Calculated Aerial and Forest Applications using the AgDRIFT model:

- aquatic set backs were determined using toxicity to aquatic animals only, and therefore do not address the possible impact of pesticides on aquatic plants;

- input differences for forestry and agricultural sprays were noted as below;

Pesticide	**Vmd (um)**	**ASAE Spray Category**	**Boom Ht (m)**	**Default Spray Rate (L/ha)**	**Surface Roughness (m)**	**Partition Fraction**	**Pond Depth (cm)**
Insecticide - Agriculture	180	Fine	3.05	30	0.0152	N/A	30
Herbicide - Agriculture	255	Fine to Medium	3.05	100	0.0152	N/A	30
Fungicide - Agriculture	255	Fine to Medium	3.05	100	0.0152	N/A	30
Insecticide - Forestry	137	Very Fine to Fine	15	5	1	1:1	15
Herbicide - Forestry	255	Fine to Medium	15	50	1	N/A	15

- the boom heights for forestry were measured from top of canopy;
- for Vmd (volume median diameter) of emitted spray - ASAE (American Society of Agricultural Engineers) default categories were used to define drop size distribution;
- a default was used if spray rate was not specified;
- surface roughness, the height of the apparent surface cover on the ground beneath the aircraft and downwind, was assumed to be 1/30 of the height of the actual surface cover;
- the ratio of pesticide that deposits in over-structures to that which reaches pond surface (partition fraction) was only considered for forestry insecticide sprays;
- meteorology was defaulted to 25^0 Celsius, 50% relative humidity and winds of 16kph;
- product was assumed to be non-volatile with a specific gravity of 1.0, only the aqueous portion of the tank mix was assumed to evaporate.

References

LC50 values:

Environment Canada, Environmental Protection Branch. 2003 Pesticide Compendium. Minister of Public Works & Government Services Canada, 2003.

Application rates and label suggested aquatic set backs:

Label Information as provided by the Pest Management Regulatory Agency (PMRA) (http://www.hc-sc.gc.ca/pmra-arla). Extracted November 2002.

Calculated ground and airblast set backs:

Ganzelmeier, H; Rautmann, D; Spangenberg, R; Streloke, M; Herrmann, M; Wenzelburger, H-J; Walter, H-F. 1995. Studies on the spray drift of plant protection products: Results of a test program carried out throughout the Federal Republic of Germany. Report Number 305 from the Biologischen Bundesanstalt fhr Land- und Forstwirtschaft, Berlin-Dahlem. Blackwell Wissenschafts-Verlag GmbH, Berlin/Vienna.

Nordby, A and Skuterud, R. 1975. The effects of boom height, working pressure and wind speed on spray drift. Weed Research 14: 385-395.

Pest Management Regulatory Agency. PMRA Excel Workbook. 1996.

AgDRIFT Calculations:

Spray Drift Task Force Modeling Subcommittee. AgDRIFT Model Version 2.0.05. August 2001.

RECOMMENDED AQUATIC SET BACKS

	Active Ingredient Application Rate	LC50 (mg/L)	Aquatic Set Backs (m) (calculated set backs and label suggested *)				Usage Pattern Comments
		RT=Rainbow trout	Ground	Air Blast	Aerial	Forestry	
1-Napthylacetic Acid	120 g/ha	57.0 (96h RT)	0	0			
1,3-Dichloropropene	188000 g/ha	0.39 (96h RT)	27.2	(38.4)28.8			
2,4-D	352.5-1292.5 g/ha	1.4 (96h RT)	50*				Label suggested set back for product containing 50% 2,4-D, 9.3% flumetsulam, 25% clopyralid.
2,4-DB	1100-1700 g/ha	4.0 (96h RT)	0		0		
Abamectin	30 g/ha	0.0016 (96h pink shrimp)	19.3	(29.1)19.8			
Acephate	562.5-825 g/ha	1.1 (96h RT)	10*				Implant cartridges for birch, elm, oak etc. Active under re-evaluation.
Allethrin	0.56 kg/ha	0.0097 (96h RT)	30				Used only in mosquito coils - domestic.
Amitrole	2025-4050 g/ha	>180 (RT)	0				
Anilazine	1250-2200 g/ha	0.15 (96h RT)	12-17				**Being discontinued by registrant 12/15/05.**
Atrazine	1000-1520 g/ha	4.3 (96h guppy)	15*				Active under re-evaluation. Label suggested set back for product containing 45g/L imazethapyr and 360g/L atrazine.
Azinphos-methyl	312.5-387.5 g/ha 30-50 g/ha 425-875 g/ha	0.004 (96h brown trout)	35-42	34(43)-36(45) 11(20)-16(25)	>1000 55-130 >1000	>1000 580->1000	Folair applications in forest/shade trees to control insect pests. Current uses under re-evaluation. **Registrant of the product Guthion has voluntarily ceased sales in Prince Edward Island**
Bacillus thuringiensis	8.96-53.6 billion ITU/ha	>0.656 (96h RT)	0-8	2(3)-8(16)	0->45		Forestry application budworm/hemlock looper.
Benomyl	1000-1500 g/ha 275g (+3.25kg Manzate/ha)	0.17 (96h RT)	9-13	3(5)			**All uses being discontinued.** 12/31/03 last date of sale for commercial products, 12/31/05 for domestic products.
Bensulide	5760-6720 g/ha	1.1 (96h RT)	4-42*				New re-evaluation document 2003.
Bentazon	840-1080 g/ha	190 (96h RT)	0		0		
Bromacil	6200-10800 g/ha	56.0 (48h RT)	0				

RECOMMENDED AQUATIC SET BACKS

	Active Ingredient Application Rate	LC50 (mg/L) RT=Rainbow trout	Aquatic Set Backs (m) (calculated set backs and label suggested *)				Usage Pattern Comments
			Ground	Air Blast	Aerial	Forestry	
Bromoxynil	281.25-337.5 g/ha	0.01 (daphnia)	23-25		110-160		
Butylate	3400-4500 g/ha	4.2 (96h RT)	0				
Captan	1600-3000 g/ha	0.066 (96h RT)	22-28	22(32)-28(38)	200-540		
Carbaryl	250-1002 g/ha	0.00004 (24h G. lacustris)	79-86	75(86)-89(100)	>1000	>1000	Active under re-evaluation.
	550 -2254 g/ha					>1000	
Carbofuran	264-528 g/ha	0.147 (96h yellow perch)	0-5		5-35		Active under re-evaluation.
Chinomethionat	156-312.5 g/ha	0.131 (96h RT)		0-4(8)			
Chlormequat chloride	3000 g/ha	16.9 (96h daphnia)	0m				
Chloroneb	9290-17880 g/ha	3.7 (96h RT)	2-8				
Chloropicrin	28000 g/ha	0.91 (3h daphnia)	23.7	(33.9) 24.5			
Chlorothalonil	1350-2437.5 g/ha	0.076 (96h RT)	19-24	19(29)-25(34)	100-380		
	750-1275 g/ha		14-18	14(23)-19(28)	100*		
Chlorpyrifos	562.5-1125 g/ha	0.003 (RT)	40-46	42(52)-49(59)	>1000		Agricultural uses under re-evaluation in Canada.
Chlorsulfuron	90 g/ha	80.0 (48h shrimp)	0				
	11.25- 52.5 g/ha		0				
Chlorthal-dimethyl	13750-16250 g/ha	>4.7 (96h RT)	<4				
Clofentezine	150-300 g/ha	>0.015 (96h RT)	<14-<20	<14(23)-<20(30)			
Copper Sulphate	1590-2915 g/ha	0.48 (96h atlantic salmon)	4-9				
Cupric hydroxide	550-1125 g/ha	0.08 (24h RT)	10-17				
Cyanazine	2200-3400 g/ha	9.0 (96h RT)	0				**Discontinued - last date of sale Dec. 2004.**
Cycloate	4500-5600 g/ha	4.5 (96h RT)	0				Only technical registered. Active in re-evaluation.
Cyhalothrin-lambda	10 g/ha	0.00024 (RT)	26	80*	>1000		

RECOMMENDED AQUATIC SET BACKS

	Active Ingredient Application Rate	LC50 (mg/L)	Aquatic Set Backs (m) (calculated set backs and label suggested *)				Usage Pattern Comments
		RT=Rainbow trout	Ground	Air Blast	Aerial	Forestry	
Cypermethrin	20-28 g/ha	0.00069 (96h RT)	23-26	36(46)-39(49)	240-405		
	70-100 g/ha		34		>1000		
	25-50 g/ha		25-31		335-900		
Deltamethrin	10-12.5 g/ha	0.00091 (96h RT)	17	15(24)-17(26)	100*		
Diazinon	275-550 g/ha	0.45 (96h brook trout)	0	1-2(4)			Agricultural uses under re-evaluation in Canada.
Dicamba	2210 g/ha	23.0 (96h bluegill)	0	(1.5)1.1			
Dichlobenil	4400-7000 g/ha	6.2 (48h daphnia)	0				
Dichlorprop	525-1225 g/ha	521 (96h RT)	0		0		
Dichlorvos	50-120 g/ha	0.0001 (96h stonefly)	49-57	51(61)-60(70)			Active under re-evaluation.
Diclofop-methyl	994 g/ha	0.23 (96h RT)	6		15		
Dicofol	3150-4180 g/ha	0.12 (24h RT)	22-25	23(32)-26(35)			
	1575 g/ha		16	16(26)			
Difenzoquat	850 g/ha	694 (96h RT)	0		0		
Diflubenzuron	37.5-68.75 g/ha	140 (96h RT)	0	0	0		Used against leaf-feeding larvae in forestry.
Dimethoate	960-2160 g/ha	0.043 (96h stonefly)	9-15	22(31)-29(39)	480		Commercial products under re-evaluation.
	264-480 g/ha				70-240		
Dimethomorph	225 g/ha	6.2 (96h RT)	0				
Dinocap	310.5 g/ha	0.015 (96h RT)	20	21(30)			
Diquat Dibromide	300-550 g/ha	21.0 (96h RT)	15*				Label suggested set back for use in western Canada.
Disulfoton	1125-2250 g/ha	0.027 (96h G. fasciatus)	26-33				**Registration will expire July 1, 2005.**
Diuron	5400-7200 g/ha	0.7 (24h G. lacustris)	11-14				
Dodine	1462.5-2112.5 g/ha	570 (96h RT)	0	0			
Endosulfan	500-875 g/ha	0.0014 (96h RT)	46-51	53(63)-66(77)	>1000		Active under re-evaluation.
	1000-2000 g/ha		52-58		>1000		
	800-3375 g/ha						

RECOMMENDED AQUATIC SET BACKS

	Active Ingredient Application Rate	LC50 (mg/L) RT=Rainbow trout	Aquatic Set Backs (m) (calculated set backs and label suggested *) Ground	Air Blast	Aerial	Forestry	Usage Pattern Comments
EPTC	3400-6800 g/ha	16.0 (96h lake trout)	0				Active under re-evaluation.
Ethephon	8500 g/ha	300 (96h bluegill)	0				
Ethion	2000 g/ha	66.0 (96h RT)	0				**Cancellation of end-use products 12/31/03.**
Etridiazole	5700 g/ha	0.77 (96h RT)	11				
Fenitrothion	140-280 g/ha	0.0043 (96h stonefly)	24-30			>1000	Active under re-evaluation.
Fenthion	55-119 g/ha	0.87 (96h RT)	0				Registered as livestock pour-on product only.
Ferbam	950-5130 g/ha	0.09 (96h guppy)	14-29	14(23)-30(40)			Active under re-evaluation.
Fluazifop-butyl	500 g/ha	1.37 (96h RT)	0				Only technical registered
Folpet	750-1000 g/1000L H_20 1000-2000 g/ha	0.185 (96h RT)	8-14	6(14)-8(17)			
Formetanate hydrochloride	4121.6 g/ha	4.42 (96h RT)	0	2(3)	0		Active under re-evaluation.
Fosamine ammonium	21600 g/ha	278 (96h bluegill)	0				
Fosetyl-Al	2400-4200 g/ha	428 (96h RT)	15*				Label suggested set back for tobacco product used in British Columbia
Glyphosate	890-2492 g/ha	130 (96h RT)	15*				
Hexazinone	405-810 g/ha	320 (96h RT)	50*		100*	100*	
Imazamethabenz	390-480 g/L	>100 (96h RT)	15*				Not registered for use in Atlantic Canada.
Imazapyr	720 g/ha	>100 (96h RT)	15*				Forestry use to control grasses/weeds.
Imidacloprid	48-312 g/ha	211 (96h RT)	15*	40*			
Iprodione	0.75-1.0 kg/ha	4.8 (96h RT)	0	0	0		
Lindane	0.55-2.75 kg/ha	0.002 (RT)	43-58				**Products phased out by December 31, 2004.**
Linuron	1.08-156 kg/ha	3.15 (96h RT)	0				
Malathion	550-1750 g/ha	0.2 (96h RT)	2-12	4(10)-13(22)	20-185		Active under re-evaluation.
Maleic hydrazide	2.25-5.55kg/ha	1435 (96h RT)	0		0		Only technical registered.

RECOMMENDED AQUATIC SET BACKS

	Active Ingredient Application Rate	LC50 (mg/L)	Aquatic Set Backs (m) (calculated set backs and label suggested *)				Usage Pattern Comments
		RT=Rainbow trout	Ground	Air Blast	Aerial	Forestry	
Mancozeb	825-2440 g/ha	2.2 (48h RT)	50*		100*		Label suggested set back for product containing 9% dimethomorph and 60% mancozeb.
Maneb	880-2600 g/ha	1.9 (48h RT)	0				
MCPA	550 g/ha	232 (96h RT)	0		0		Active under re-evaluation.
MCPB	1.4-1.7 kg/ha	75.0 (48h RT)	0				
Mecoprop	0.825-1.275 kg/ha	150 (96h trout)	0		0		Active under re-evaluation.
Metalaxyl	200-1000 g/ha	>100 (96h RT)	0		0		
Metaldehyde	3.25 kg/ha	75.0 (96h RT)	0				
Metam	444000 g/ha	0.079 (96h RT)	70.3	(85.1)74.4			
Methamidophos	0.528-1.08kg/ha	25.0 (96h RT)	0				Active under re-evaluation.
Methomyl	268.75-483.75 g/ha 1290-1938 g/ha	3.4 (96h RT)	0	1-2	0	0	In woodlands to control insects/spruce budworm. Active under re-evaluation.
Methoxychlor	1.44 kg/ha	0.0072 (48h RT)	40		>1000		Aerial application unlikely in Atlantic Canada.
Methyl isothiocyanate	36000 g/ha	0.06 (24h daphnia)	50.3	(63.1)53.0			
Metiram	0.88-1.8 kg/ha 2.4-4.8 kg/ha	1.1 (96h RT)	0	4(8)-7(15)	0		
Metobromuron	1.375-3.375 kg/ha	36.0 (96h RT)	0				
Metolachlor	1.95-2.7 kg/ha	2.0 (96h RT)	50*				Label suggested set back for product containing 28g/L flumetsulam and 895g/L metolachlor.
Metribuzin	275-425 g/ha	64.0 (96h RT)	15*				
Metsulfuron-methyl	4.5 g/ha	>150 (96h RT)	15-45*				Not registered for use in Atlantic Canada.
Mineral oil	800000 g/ha	100000 (96h RT)	0				
Monolinuron	0.11-2.2 kg/ha	56.0 (96h RT)	0				
Napropamide	1.13-2.25 kg/ha	16.6 (96h RT)	0				
Naptalam	2.64-5.28 kg/ha	76.1 (96h RT)	0				
Oxamyl	2244 g/ha	4.2 (96h RT)	0	(1.4)1.0			
Oxycarboxin	12.5-18.75 g/100m^2	19.9 (96h RT)	0				**Registration expired 2002. Expect re-registration.**

RECOMMENDED AQUATIC SET BACKS

	Active Ingredient Application Rate	LC50 (mg/L)	Aquatic Set Backs (m) (calculated set backs and label suggested *)				Usage Pattern Comments
		RT=Rainbow trout	Ground	Air Blast	Aerial	Forestry	
Oxydemeton-methyl	0.240-0.56 kg/ha	17.0 (96h RT)	0	0	0 (Tobacco)	0	Control of sucking insects and mites in woodlands.
Oxyfluorfen	120 g/ha	0.41 (96h trout)	0				Only technical registered.
Paraquat	0.264-0.528 kg/ha	32.0 (96h RT)	45-55*				Label suggested set back for product containing 132g/L paraquat and 66g/L diquat.
Parathion	0.168-0.528 kg/ha	1.5 (96h RT)	0	1(1)			Active under re-evaluation.
Pebulate	4.5-6.66kg/ha	7.4 (96h RT)	0				Only technical registered. Active under re-evaluation.
Pendimethalin	1.68-3.12kg/ha	0.14mg/L (96h RT)	15-21				
Permethrin	0.07-0.150kg/ha	0.0025mg/L (96h RT)	23-30	24(33)-31(41)	400- >1000		
Phorate	1.1-2.2 kg/ha	0.013 (96h RT)	33-39		480-500		**Registration expired 2002, potato use phased out by 2004.**
Phosalone	0.975-1.5 kg/ha	0.3 (RT)		5(12)-7(16)			Active under re-evaluation.
Phosmet	0.625-1.875 kg/ha	0.23 (96h RT)	2-12	4(10)-12(21)			Commercial uses currently under re-evaluation.
Picloram	0.455-2.275 kg/ha	2.35 (96h lake trout)	0		0		Granular formulations not registered in Canada.
Pirimicarb	0.213-0.850 kg/ha	29.0 (96h RT)	0	0	0		
Prometryn	1.746-2.134 kg/ha	2.5 (96h RT)	0				
Propamocarb hydrochloride	1.01 kg/ha	235 (96h carp)	0				
Propiconazole	50.0-125 g/ha	5.3 (96h RT)	0		0		
Propoxur	0.14-1.1 kg/ha	3.7 (96h RT)	0	0	0		Registered commercially for mosquito control only. Active under re-evaluation.
Propyzamide	0.45-2.25 kg/ha	>4.7 (96h RT)	0	1	0		
Pyrazon	3.55-4.4 kg/ha	32.0 (96h RT)	0				Only technical registered.
Quintozene	6750 g/ha	0.31 (96h RT)	20.6	(30.6)21.2			
Rimsulfuron	12.5-15 g/ha	>390 ppm (96h)	10*				
Sethoxydim	147.2-496.8 g/ha	1.2 (96h RT)	0	1	0		

RECOMMENDED AQUATIC SET BACKS

	Active Ingredient Application Rate	LC50 (mg/L)	Aquatic Set Backs (m) (calculated set backs and label suggested *)				Usage Pattern Comments
		RT=Rainbow trout	Ground	Air Blast	Aerial	Forestry	
Simazine	4.4-6.3 kg/ha	25.0 (96h RT)	0	0		0	Used in Christmas tree plantations.
Sulfur	196000 g/ha	100000 (96h RT)	0				
Tallow fatty acid amine ethoxylate	600 g/ha	0.4 (96h Salmo trutta)	0		0		Spray adjuvant for use with glyphosate only.
Tebufenozide	70 g/ha 120-240 g/ha	2.9 (21d Daphia magna)		15*	0-350	0-350	Forestry use in Newfoundland, observe aquatic set back of 50m or 100m for salmon rivers.
Terbacil	1.8-3.6 kg/ha	39.7 (96h RT)	20*				
Terbufos	0.3-0.8 kg/ha	0.01 (96h RT)	24-32				**Registration expired 2002, use phased out by 2004.**
Thifensulfuron methy	15 g/ha	>100 (96h RT)	0				
Thiophanate methyl	0.47-1.5 kg/ha	7.8 (48h RT)	0	0	0		Active under re-evaluation.
Thiram	9.4-13.1 kg/ha	0.13 (48h trout)	31-34				Active under re-evaluation.
Trichlorfon	0.56-1.76 kg/ha	0.33 (96h RT)	0-8	3(6)-8(17)	2-90		
Triclopyr	0.480-3.84 kg/ha	0.74 (96h RT)			4-487*	4-487*	In forests for control of woody plants/broadleaf weeds. See label for detailed set backs.
Trifluralin	0.576-1.152 kg/ha	0.01 (96h RT)	50*				Label suggested set back for product containing 30g/L flumetsulam and 408g/L trifluralin.
Triforine	323-570 g/ha	>1000 (96h RT)	0	0	0		
Zineb	1.4-5 kg/ha	2.0 (96h perch)	0-1	1(2)-4(9)			Active under re-evaluation.

19.0 SEPARATION CHART FOR STORAGE OF DANGEROUS GOODS

National Fire Code, 1995 3.2.7.6
Separation Chart for Storage of Dangerous Goods
Forming Part of Sentences 3.2.7.6.(1), 3.2.7.9.(2), 3.3.4.3.(2) and 4.2.2.3.(2)

Classification (1)	2.1	2.2	2.3	2.4	3	4.1	4.2	4.3	5.1	5.2	6	8
2.1	-	P	X	X	P	P	A	DS	X	X	X	X
2.2	P	-	P	P	P	P	P	P	P	P	P	P
2.3	X	P	-	A	X	A	A	DS	A	X	P	A
2.4	X	P	A	-	X	A	A	DS	A	X	DS	A
3	P	P	X	X	-	P	A	A	X	X	DS	A
4.1	P	P	A	A	P	-	A	DS	X	X	DS	A
4.2	A	P	A	A	A	A	-	DS	X	X	DS	A
4.3	DS	P	DS	DS	A	DS	DS	-	X	X	DS	X
5.1	X	P	A	A	X	X	X	X	-	P	A	X
5.2	X	P	X	X	X	X	X	X	P	-	X	X
6	X	P	P	DS	DS	DS	DS	DS	A	X	-	A
8	X	P	A	A	A	A	A	X	X	X	A	-

X Incompatible goods, do not store together in fame fire compartment.
A Incompatible goods, separate by minimum 1 m horizontal distance.
P Permitted, goods are permitted to be stored together.
DS Refer to Material Safety Data Sheet.

Notes to Table 3.2.7.6.

[1] The numbers refer to the class and division of dangerous goods in Table 3.2.7.1.